FINAL REPORT

INFLOW NEEDS ASSESSMENT: EFFECT OF THE COLORADO RIVER DIVERSION ON BENTHIC COMMUNITIES

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RESEARCH TECHNICAL FINAL REPORT

INFLOW NEEDS ASSESSMENT:

EFFECT OF THE COLORADO RIVER DIVERSION ON BENTHIC COMMUNITIES

TO

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BY

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ACKNOWLEDGEMENTS

Under the Clean Rivers Act (SB 818) the Lower Colorado River Authority (LCRA) has become responsible for the assessment of water quality within the Colorado River Estuary. The LCRA is responsible for management of water resources that affect the amount of freshwater inflow to the bay. Therefore, the LCRA's water management role is directed by its responsibility as a natural resource steward. This study was partially funded by the LCRA. The author has benefitted by discussions with Cynthia Gorham of the LCRA.

In response to House Bill 2 (1985) and Senate Bill 683 (1987), as enacted by the Texas Legislature, the Texas Parks and Wildlife Department and the Texas Water Development Board (TWDB) must maintain a continuous data collection and analytical study program on the effects of and needs for freshwater inflow to the State's bays and estuaries. As part of the mandated study program, this research project was partially funded through the TWDB's Water Research and Planning Fund, authorized under Texas Water code Sections 15.402 and 16.058(e), and administered by the Department under interagency cooperative contracts Nos. 93-483-352 and 94-483-003. The author has benefitted by discussions with Gary Powell, William Longley, and David Brock of the TWDB.

This study is also partially supported by University of Texas at Austin, Marine Science Institute. The author especially thanks Mr. Richard D. Kalke for all his help and technical support during all phases of this work, especially sample collection and analysis. Ms. Carol Simanek played a vital role in data management.

ABSTRACT

The Lavaca-Colorado Estuary has three major sources of freshwater inflow: the Lavaca, Tres Palacios, and Colorado Rivers. In 1991 the Colorado River was diverted to increase freshwater inflow into the east arm of Matagorda Bay. It was hypothesized that increased freshwater inflow would enhance productivity in the bay. The goal of this study was to determine the status of the bay and effectiveness of the water management program. Six stations were chosen along the major inflow gradients of the Lavaca and Colorado Rivers, and sampled quarterly for one year. Benthic macrofaunal abundance, biomass and community structure was measured. Observed salinity gradients at the stations indicated that marine water was diluted by freshwater near the mouthes of the rivers. Lavaca Bay and the east arm of Matagorda Bay had similar, low salinity characteristics. Both areas had similar community structure, and were typical of low salinity zones of Texas estuaries. However, there was an obvious enhancement of abundance, biomass and diversity in the east arm of Matagorda Bay (near the diversion of the Colorado River) relative to Lavaca Bay. These results indicate that the diversion probably has enhanced the productivity and health of Matagorda Bay. The only confounding factor is that the east end of Matagorda Bay also has less development than Lavaca Bay.

INFLOW NEEDS ASSESSMENT: EFFECT OF THE COLORADO RIVER DIVERSION ON BENTHIC COMMUNITIES

INTRODUCTION

The Lower Colorado River Authority (LCRA) has become responsible for the assessment of water quality within the Colorado River Estuary in addition to developing a Water Management Plan for the LCRA district. Included within the river's influence are East Matagorda Bay, Matagorda Bay, its secondary and tertiary bays and associated wetlands. Matagorda Bay is of special interest due to the recent diversion of freshwater from the Colorado River into East Matagorda Bay. The purpose of the diversion is to increase productivity of the commercial fishery in the bay. The diversion has changed the estuary dramatically. Previous to the diversion the estuary was named the Lavaca-Tres Palacios Estuary for the two primary sources. Now, the Colorado River has a higher input to the estuary that all other sources combined, and the estuary has been renamed the Lavaca-Colorado Estuary. Because of the changes in the estuary brought about by the diversion, there is a need to monitor and assess the effects of the diversion on biological communities.

The University of Texas, Marine Science Institute, Benthic Ecology Program began sampling the Lavaca-Colorado Estuary in November 1984, and sampled it bimonthly for two years (Kalke and Montagna, 1991). Starting in July 1988, we began a sampling program to compare the Lavaca-Colorado and Guadalupe Estuaries (Montagna, 1992). The Texas Water Development Board (TWDB) funded these studies to determine the need for freshwater in this ecosystem. These studies focused on the effect of inflow from the Lavaca and Navidad Rivers. However, since the diversion of the Colorado, the salinity and circulation patterns in Matagorda Bay has changed. An assessment of the success of the management plan is needed. A first step toward providing such information is to monitor the benthic community. Benthos are the most economical and reliable indicators of the effects of freshwater inflow in Texas estuaries (Montagna, 1989; 1992). This contradicts the conventional wisdom. Rivers transport nutrients to estuaries, which should stimulate phytoplankton production (Nixon et al., 1986). The benthos would benefit by this production if filter feeders, e.g., oysters consume phytoplankton in the water column or if the primary production is deposited to the bottom via gravity (Montagna and Yoon, 1991). Benthos are relatively fixed in space and easy to sample accurately, long-lived and integrate effects over a long time period, and many community characteristics can be measured inexpensively. There are also ecological models that provide a scientific basis for interpreting the data generated in benthic monitoring and detection studies.

The goal of the present study is to provide information on the response of the benthic communities to the current freshwater inflow regimes in the Lavaca-Colorado Estuary. Specifically, we wanted to obtain data on benthic abundance, biomass, and community diversity to assist in assessing the freshwater inflow needs to maintain biological productivity in Matagorda Bay.

METHODS

Study Area

Six stations were chosen for study (Figure 1). One station (A) has been sampled since 1984, when it was labeled station 85 (Kalke and Montagna, 1991). The station was renamed A when a long-term monitoring program was established in 1988 (Montagna, 1991). At that time stations B, C, and D were also added to the sampling program. Stations A and B are in the freshwater influenced zone of Lavaca Bay. The stations A through D are along a salinity gradient (from fresh to marine) generated by inflow from the Lavaca River. For the purposes of this study, stations E and F were added in the eastern arm of Matagorda Bay to assess the influence of the Colorado River on that environment. Stations F, E, and D are along a salinity gradient (from fresh to marine) generated by inflow from the Colorado River.

Hydrography

Hydrographic measurements were taken at each station during each collection period. These measurements were taken just below the water surface and at the bottom of the water column. The information taken consisted of depth, water temperature, pH, dissolved oxygen, salinity, and conductivity. Information on weather conditions such as wind speed, wind direction, cloud cover, and wave height was also recorded.

Sediment

Sediment samples from each station were taken only during the first collection period to determine grain size characteristics using techniques described by Folk (1964). These samples were placed in a jar and filled with distilled water and hydrogen peroxide and were allowed to sit for one week to remove bacteria. The samples were then filtered to remove sand and shell hash from the silt and clay. Sediment that was left on the filter was placed in a 50 ml beaker that was previously weighed. That sediment was then dried at 80 °C for 24 h and then weighed.

The sediment fraction that flowed through the 62.5 μm sieve was placed in a 1,000 ml graduated cylinder. The temperature of the water in the cylinders was measured to determine the sediment settling time between subsamples. Each graduated cylinder was well mixed and a 20 ml subsample was placed in a preweighed 50 ml beaker. After settling, another 20 ml subsample was taken and placed in a preweighed 50 ml beaker. These fractions were all dried at 80 °C and then the total dry weight was measured.

Benthic Abundance and Biomass

Benthic biomass, abundance and community structure were measured using the standard techniques that we (Montagna and Kalke, 1992) have been using since 1984. The sediment cores are taken by hand by divers within a 2 m radius. The cores are

6.715 cm diameter, covering an area of 35.4 cm^2. The cores are sectioned (at 0-3 cm, and 3-10 cm intervals) to examine the vertical distribution of macrofauna. Animals are then extracted, enumerated, identified, and dried at 50 °C for 24 hours and weighed. Mollusk shells are removed by an acidic vaporization technique (Hedges and Stern, 1984).

Statistical Analyses

Statistical analyses to reveal differences among sampling periods, stations and sediment depths are performed using general linear model procedures (SAS, 1985). Two-way analysis of variance (ANOVA) models are used where sampling dates and stations are the two main effects. Three-way ANOVA is used where date, station and sediment depth are the main effects. Orthogonal linear contrasts are used to test *a priori* hypotheses about differences among sample means, e.g., stations E and F are different from stations C and D. Tukey multiple comparison procedures are used to find *a posteriori* differences among sample means (Kirk, 1982).

Factor analysis with rotated and unrotated factors is used to determine if communities are similar on different sampling dates or stations. Cluster analysis was also used to determine the similarity of species composition at different stations.

Diversity Analyses

Diversity is calculated using Hill's diversity number one (N1) (Hill, 1973). It is a measure of the effective number of species in a sample, and indicates the number of abundant species. It is calculated as the exponentiated form of the Shannon diversity index:

$$N1 = eH' \qquad (1)$$

As diversity decreases N1 will tend toward 1. The Shannon index is the average uncertainty per species in an infinite community made up of species with known proportional abundances (Shannon and Weaver, 1949). The Shannon index is calculated by:

$$H' = -\sum_{i-1}^{S}\left[\left(\frac{n_i}{n}\right)\ln\left(\frac{n_i}{n}\right)\right] \qquad (2)$$

Where n_i is the number of individuals belonging to the *i*th of S species in the sample and n is the total number of individuals in the sample.

Richness is an index of the number of species present. The obvious richness index is simply the total number of all species found in a sample regardless of their abundances. Hill (1973) named this index N0. Another well known index of species richness is the Margalef (1958) index (R1). R1 is based on the relationship between the number of species (S) and the total number of individuals (n) observed:

$$R1 = \frac{S-1}{\ln(n)} \tag{3}$$

Although common, this relationship presupposes that there is a functional relationship between S and n. This assumption may not be justified in all cases.

Evenness is an index that expresses that all species in a sample are equally abundant. Evenness is a component of diversity. Two evenness indices, E1 and E5, have been calculated. E1 is probably the most common, it is the familiar J' of Pielou (1975). It expresses H' relative to the maximum value of H':

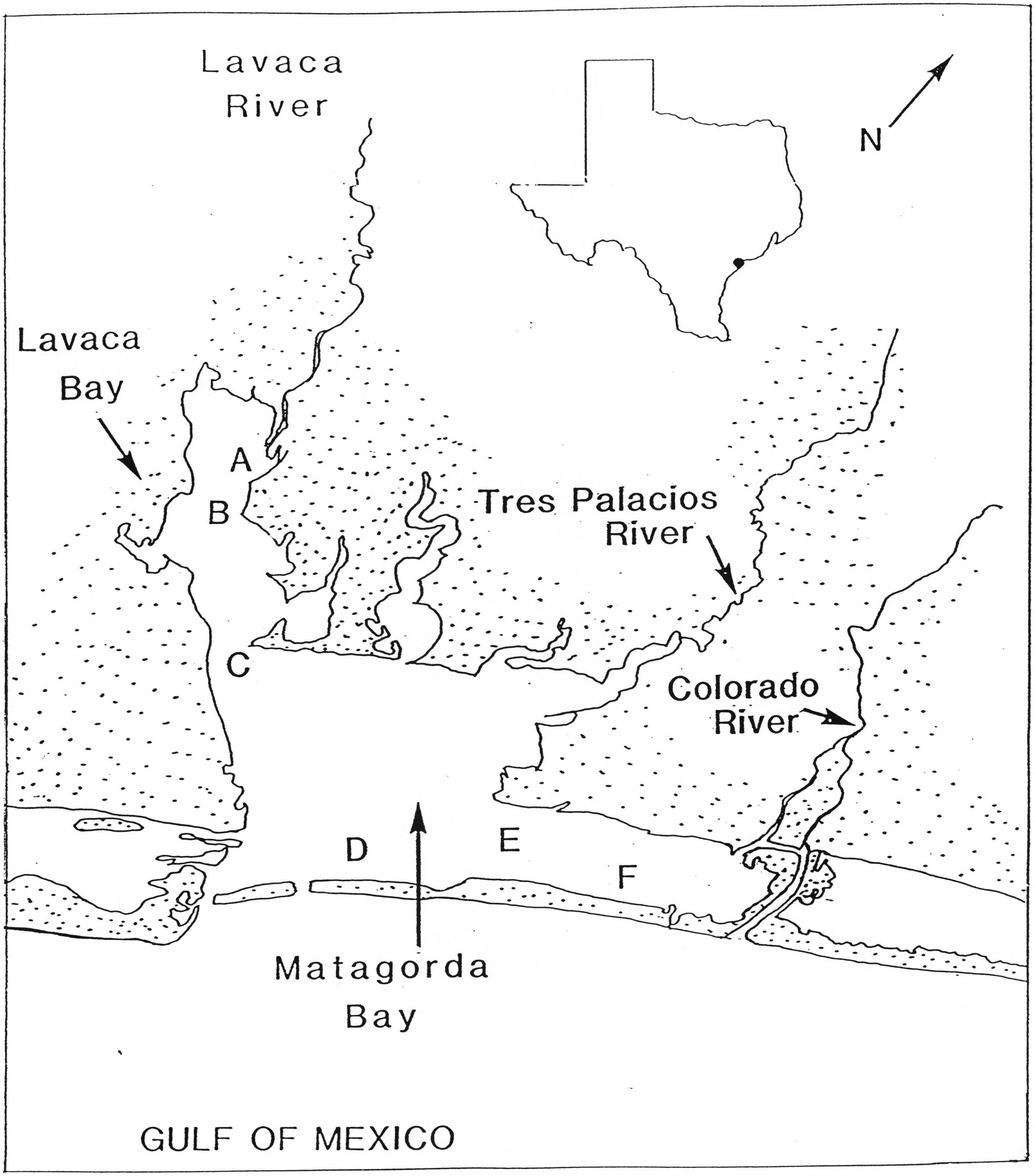
$$E1 = \frac{H'}{\ln(S)} = \frac{\ln(N1)}{\ln(N0)} \tag{4}$$

E1 is sensitive to species richness. E5 is an index that is not sensitive to species richness. E5 is a modified Hill's ratio (Alatalo, 1981):

$$E5 = \frac{(1/\lambda)-1}{N1-1}$$
$$where, \lambda = \sum_{i=1}^{S} \frac{n_i(n_i-1)}{n(n-1)} \tag{5}$$

λ is the Simpson (1949) diversity index. E5 approaches zero as a single species becomes more and more dominant.

Figure 1. Sampling locations within the Lavaca-Colorado Estuary.


Lavaca
River
N
Lavaca
Bay
A
B
C
Tres Palacios
River
Colorado
River
D
E
F
Matagorda
Bay
GULF OF MEXICO

RESULTS

There was little difference between the surface and bottom water in any of the hydrographic characteristics measured (Appendix I). Bottom water salinity varied with season and sampling location (Figure 2). Salinity was lowest in the spring at all stations except for stations B and C, which were lowest in July. Freshwater in the east arm of Matagorda Bay was evident. The average salinity at station F (16 ‰) was similar to salinities at station B (16 ‰) in Lavaca Bay. These were not as low as the average salinity near the Lavaca River (11 ‰). Station E (21 ‰) was similar to station C (19 ‰). Station D, nearest the Matagorda Ship Channel had the most marine condition (27 ‰). Temperature differences were largely seasonal. Averaging 14 °C in January, 18 °C in April, 28 °C in July, and 25 °C in October. Dissolved oxygen also exhibited a seasonal response, dropping in summer (Figure 3). There was also a hypoxic condition in the most marine station (D) in July, when the concentration dropped to 1.9 $mg \cdot l^{-1}$.

Sediment grain size was similar in the surface and subsurface sediment sections (Appendix II). All sediments were dominated by fine fractions of silt and clay (Figure 4). There is more silt than clay in stations A and B, but there is more clay than silt in stations E and F. Only station C had an appreciable amount of sand (32%). Sand content at all the other stations was similar.

Most of the benthic animals were found in the top 3 cm of sediment (Figure 4). On average 80% of the total numbers of individuals were found in the top 0-3 cm of sediment, and 20% was found in the bottom 3-10 cm of sediment. The opposite is true for biomass (Figure 5). On average, 27% of the biomass is found in the surface, and 73% of the biomass is found in the deeper sediments. There are no station differences in vertical distribution for biomass (3-way ANOVA, P=0.1323) or abundance (3-way ANOVA, P=0.2813). At all stations, the higher densities of infauna in the surface sediments are due to higher numbers of polychaetes (Table 1). Rare large polychaetes are responsible for the higher biomass in deeper sediments at stations B, C, E and F. Large mollusks dominated biomass at deeper sediments at station A, and holothuroids were found at depth at station D. Overall, polychaetes dominate the abundance values, but share dominance of biomass values with other large rare organisms, e.g., anemones and holothuroids (Table 2, Appendix III).

Since, there was little difference among stations in vertical distribution of abundance and biomass it is convenient to combine the sections and discuss trends to a depth of 10 cm (Table 3). In general, there was a spring peak in abundance (Figure 7) and biomass (Figure 8) at all stations. There was no interaction between dates and stations (2-way ANOVA, P=0.1449) indicating that seasonal changes were similar among stations for biomass. There were differences among stations. The general trend was for higher amounts of biomass at the Colorado River stations, and less at the Lavaca Bay stations (mean biomass in $mg \cdot m^{-2}$, station name, and Tukey test):

8.5	3.7	2.4	2.0	1.3	1.0
D	F	E	C	B	A

The mean of the Colorado River stations (3.1 $g \cdot m^{-2}$) is not significantly different greater than the mean of the Lavaca Bay stations (1.1 $g \cdot m^{-2}$) (linear contrast, $P=0.2444$). Biomass at all the Matagorda bay stations are the same (liner contrast, $P=0.1892$). Biomass in Matagorda Bay (4.1 $g \cdot m^{-2}$) is different from biomass in Lavaca Bay (1.1 $g \cdot m^{-2}$) (linear contrast, $P=0.0383$). There was an interaction between dates and stations (2-way ANOVA, $P=0.0165$) indicating that there were seasonal changes among stations for abundance. There were differences among stations. The general trend was for higher amounts of abundance at the Colorado River stations, and less at the Lavaca Bay stations (mean number of individuals in $n \cdot m^{-2}$ rounded to nearest 100, station name, and Tukey test):

12900	12600	11600	11100	9300	7600
F	D	C	E	A	B

The mean of the Colorado River stations (12,000 $n \cdot m^{-2}$) is greater than the mean of the Lavaca Bay stations (8,500 $n \cdot m^{-2}$) (linear contrast, $P=0.0134$). Abundance at all the Matagorda bay stations are the same (liner contrast, $P=0.9319$). Abundance in Matagorda Bay (12,000 $n \cdot m^{-2}$) is different from abundance in Lavaca Bay (8,500 $n \cdot m^{-2}$) (linear contrast, $P=0.0041$).

Estuarine-wide (where $n=4$ times), there is no direct correlation with salinity and abundance (Figure 9, $P=0.6075$) or biomass (Figure 10, $P=0.7055$). Changing salinity at different stations ($n=24$) does not correlate with abundance ($P=0.6146$) or biomass ($P=0.8824$). However, temperature and dissolved oxygen do have effects on abundance, but not biomass. Temperature increases result in lower abundances at the different stations ($n=24$, $r=-0.72$, $P=0.0001$). Dissolved oxygen increases result in higher abundances at the different stations ($n=24$, $r=0.65$, $P=0.0001$).

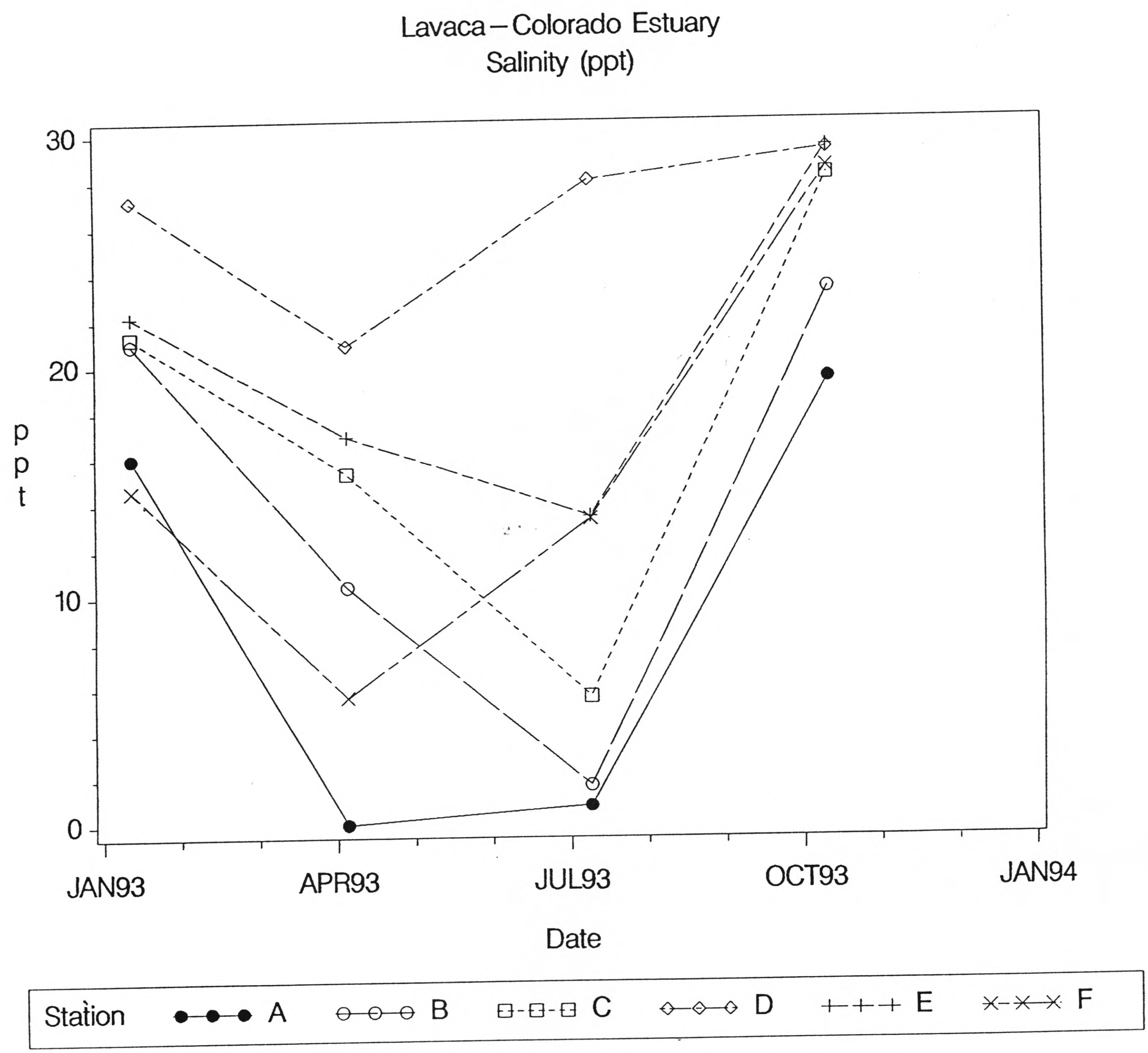
A total of 79 species were found in the Lavaca-Colorado estuary (Table 4). Diversity (N1) did not change over time (2-way ANOVA, $P=0.7595$), but there were station differences (2-way ANOVA, $P=0.0002$) (Figure 11). In general, diversity was highest in the most marine stations, and lowest at the freshest stations (mean diversity index, N1, as the number of dominant species, station name, and Tukey test):

8.2	6.4	4.6	3.8	2.8	2.2
D	E	C	F	B	A

Macrofauna evenness was not different among stations (2-way ANOVA, $P=0.3614$), but did change over time (2-way ANOVA, $P=0.0028$) (Figure 12). In general evenness increased from January through October, 1994. There are fewer species in the freshwater stations, and they dominate the community (Figure 13). In contrast, the dominance of species at the marine stations is much less (Figure 13). At each sampling period, diversity was lowest in the freshwater stations, and highest in the marine stations (Table 5).

Species composition was most similar at the freshwater stations A and F at the mouths of rivers (Figure 14). Station B in Lavaca Bay also was similar to the freshwater influenced stations. The freshwater stations were different from the more marine influenced stations (C, D, and E) in Matagorda Bay (Figure 14). Station D seems to be the most unique (Figure 15). This is because many brackish species are absent, and oceanic species are present (Table 4). Brackish species, e.g., *Mulinia lateralis* and *Streblospio benedicti* dominate all stations, except for station D. In contrast, there are 21 species that occur only at station D. The dominant species at all stations was *Mediomastus ambiseta*.

Figure 2. Bottom water salinity at six stations in the Lavaca-Colorado Estuary.



Lavaca–Colorado Estuary
Salinity (ppt)
30
20
10
0
ppt
JAN93
APR93
JUL93
OCT93
JAN94
Date
Station
A
B
C
D
E
F

Figure 3. Bottom water oxygen at six stations in the Lavaca-Colorado Estuary.

Lavaca – Colorado Estuary

Dissolved Oxygen ($mg \cdot l^{-1}$)

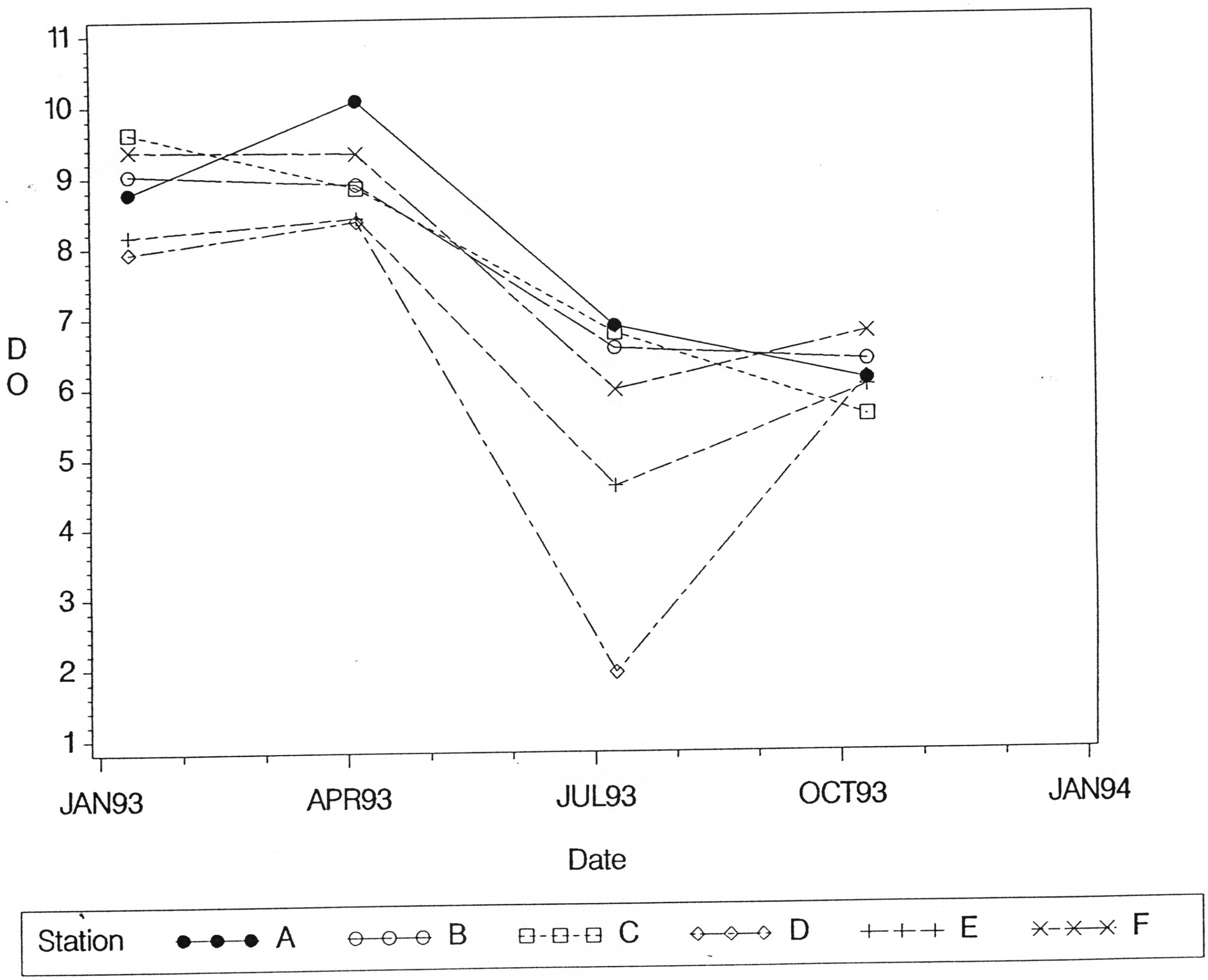


Figure 4. Sediment grain size in the Lavaca-Colorado Estuary. Average of 0-3 and the 3-10 cm sections.

Lavaca – Colorado Estuary Sediment Composition (% dry weight)

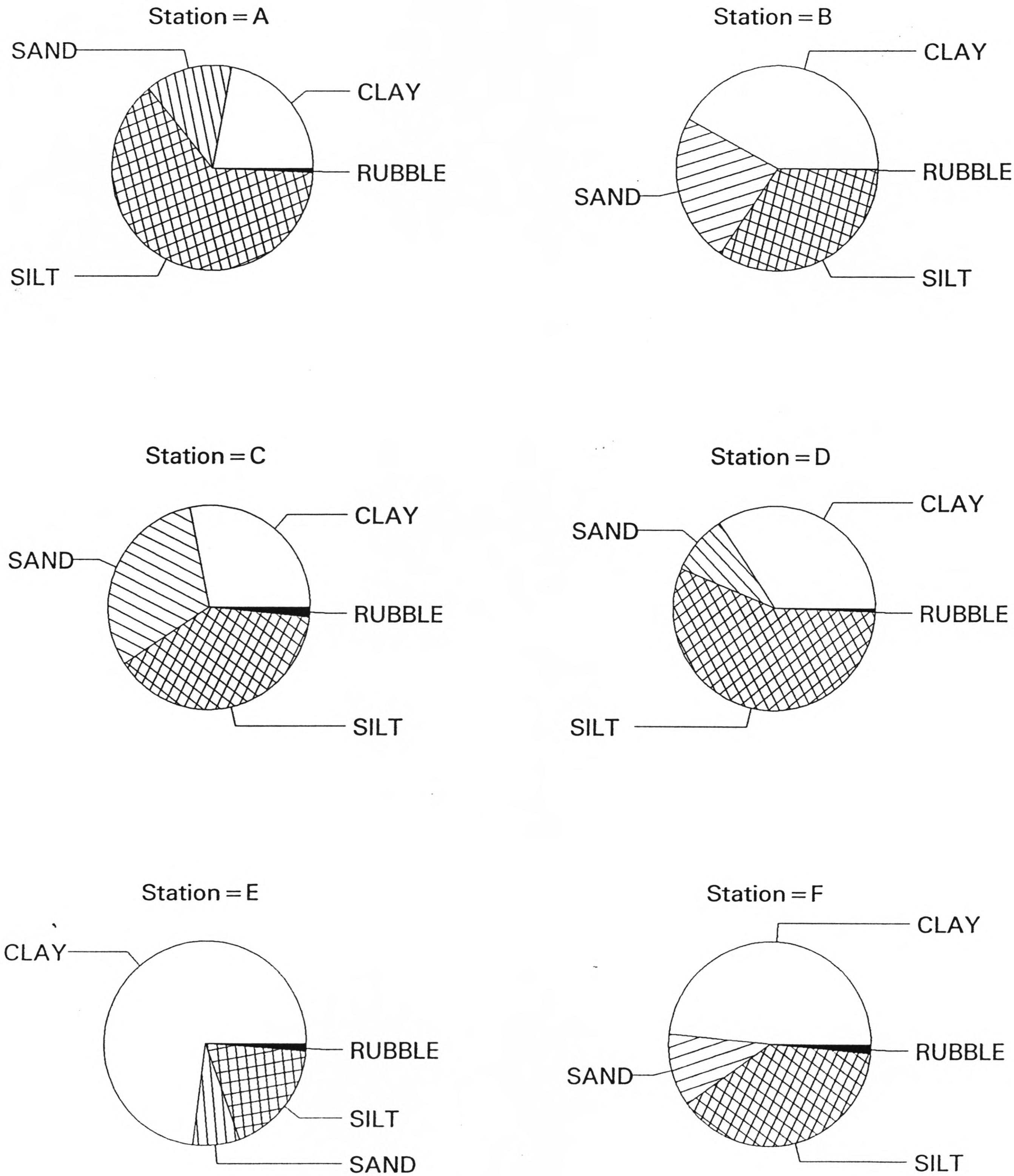


Figure 5. Vertical distribution of macrofauna abundance at six stations in the Lavaca-Colorado Estuary. Samples taken at a depth of 0-3 and 3-10 cm, average of *n*=3.

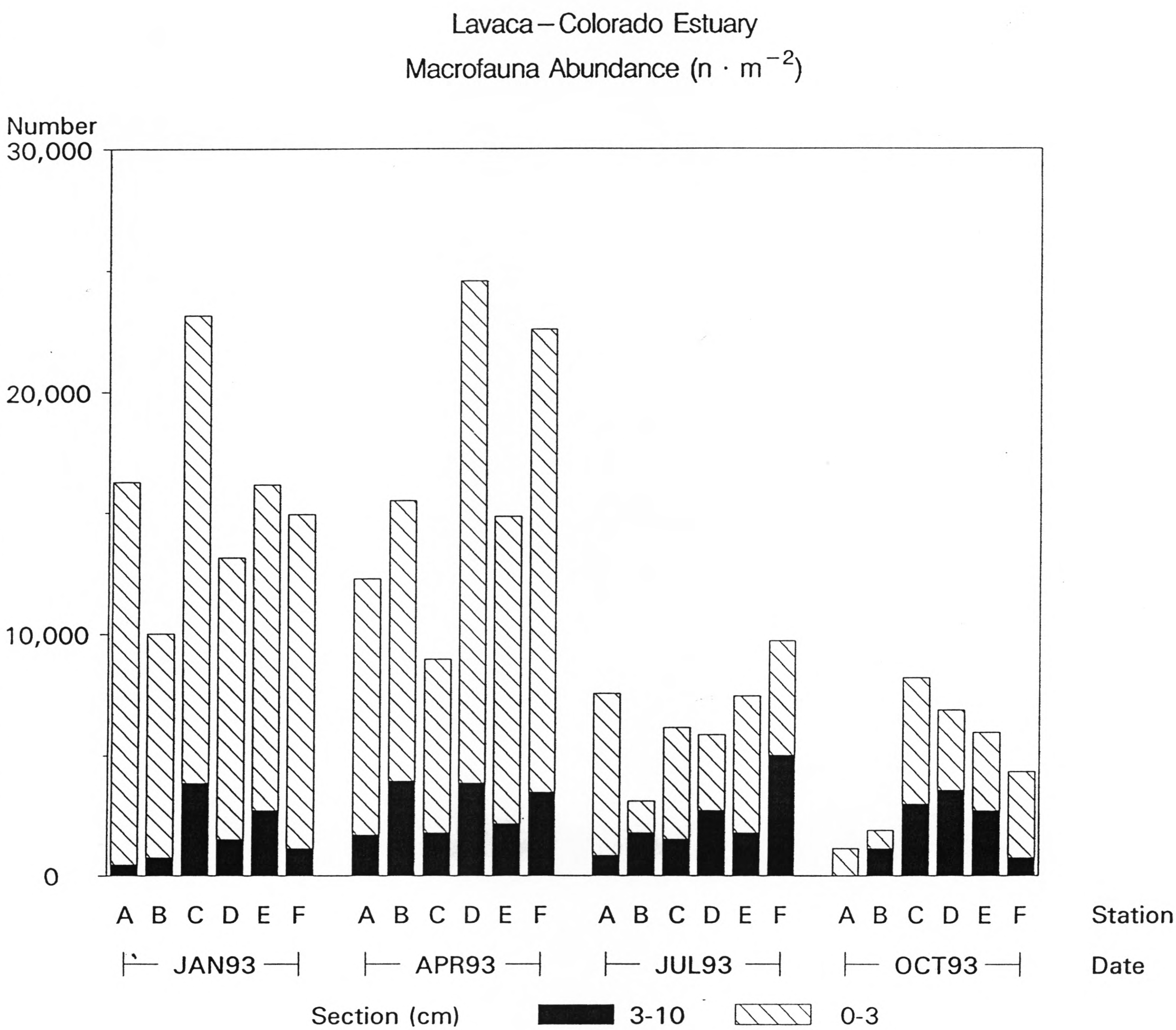

Lavaca – Colorado Estuary
Macrofauna Abundance (n · m⁻²)
Number
30,000
20,000
10,000
0
A B C D E F A B C D E F A B C D E F A B C D E F
Station
JAN93
APR93
JUL93
OCT93
Date
Section (cm)
3-10
0-3

Figure 6. Vertical distribution of macrofauna biomass at four stations in the Lavaca-Colorado Estuary. Samples taken at a depth of 0-3 and 3-10 cm, average of n=3.

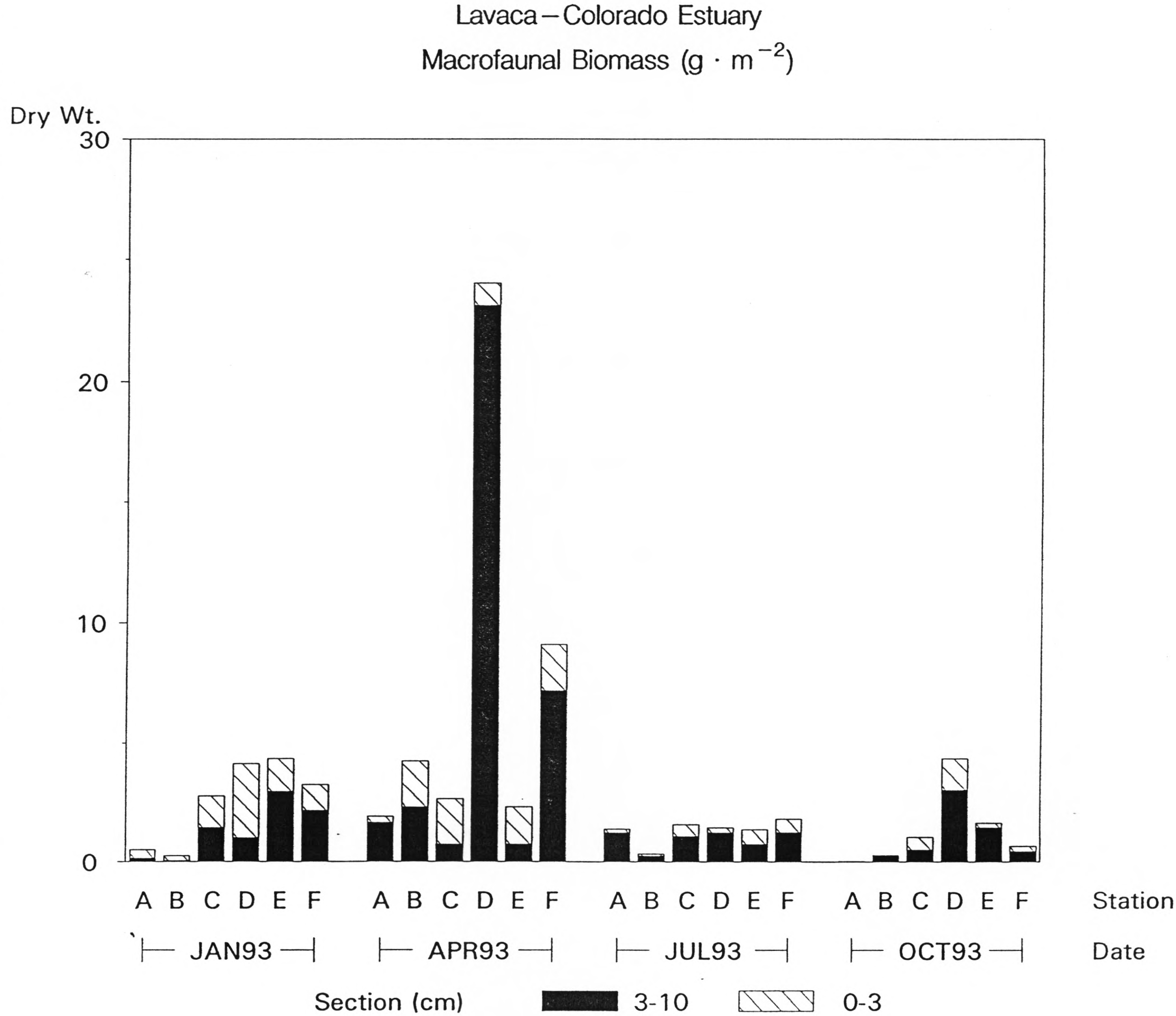

Lavaca – Colorado Estuary
Macrofaunal Biomass (g · m⁻²)
Dry Wt.
30
20
10
0
A B C D E F
A B C D E F
A B C D E F
A B C D E F
Station
JAN93
APR93
JUL93
OCT93
Date
Section (cm)
3-10
0-3

Figure 7. Macrofauna abundance at four stations in the Lavaca-Colorado Estuary. Samples taken to a depth of 10 cm, average of n=3.

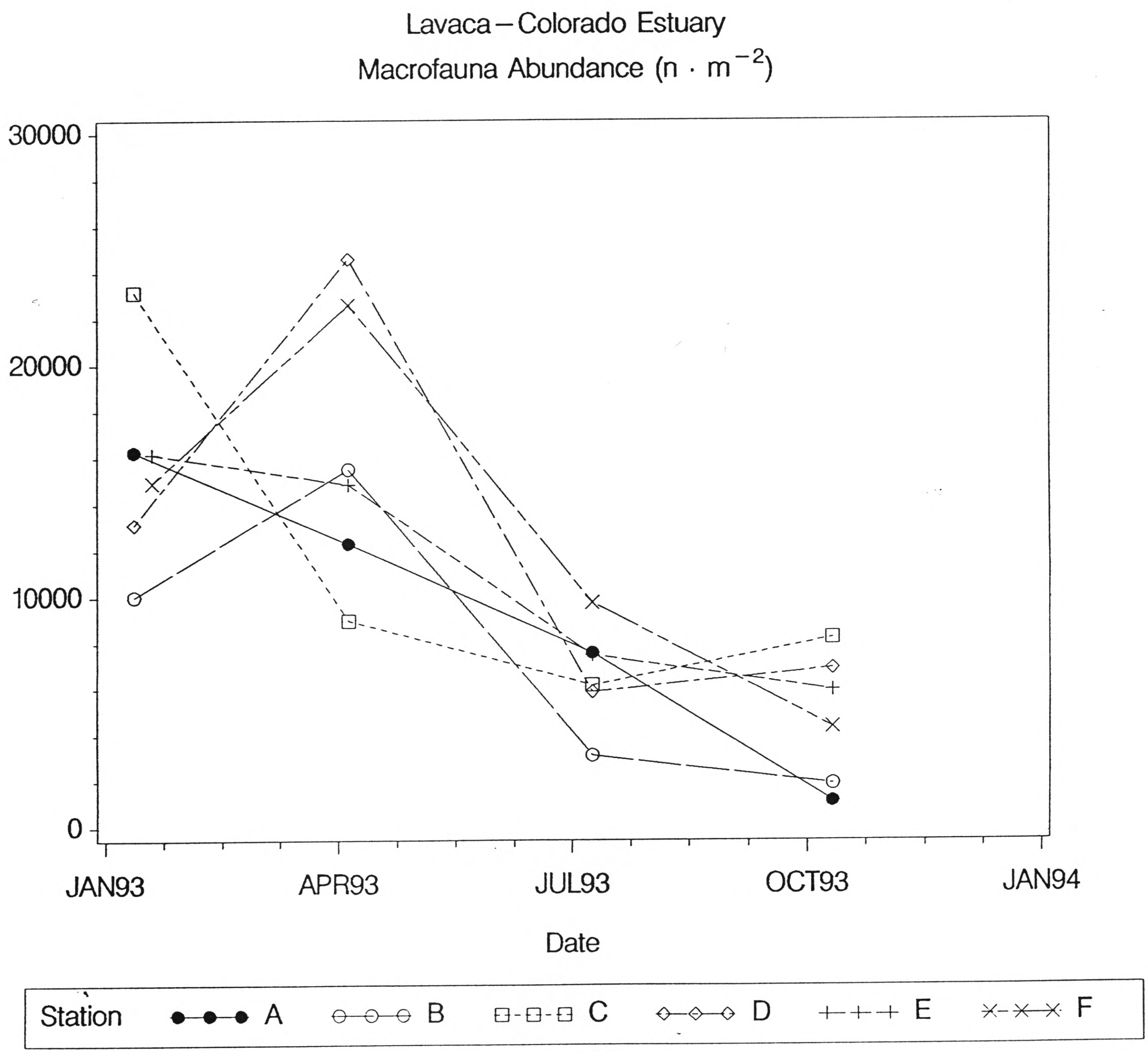

Lavaca – Colorado Estuary
Macrofauna Abundance (n · m⁻²)
30000
20000
10000
0
JAN93
APR93
JUL93
OCT93
JAN94
Date
Station
A
B
C
D
E
F

Figure 8. Macrofauna biomass at four stations in the Lavaca-Colorado Estuary. Samples taken to a depth of 10 cm, average of *n*=3.

Lavaca – Colorado Estuary

Macrofauna Biomass ($g \cdot m^{-2}$)

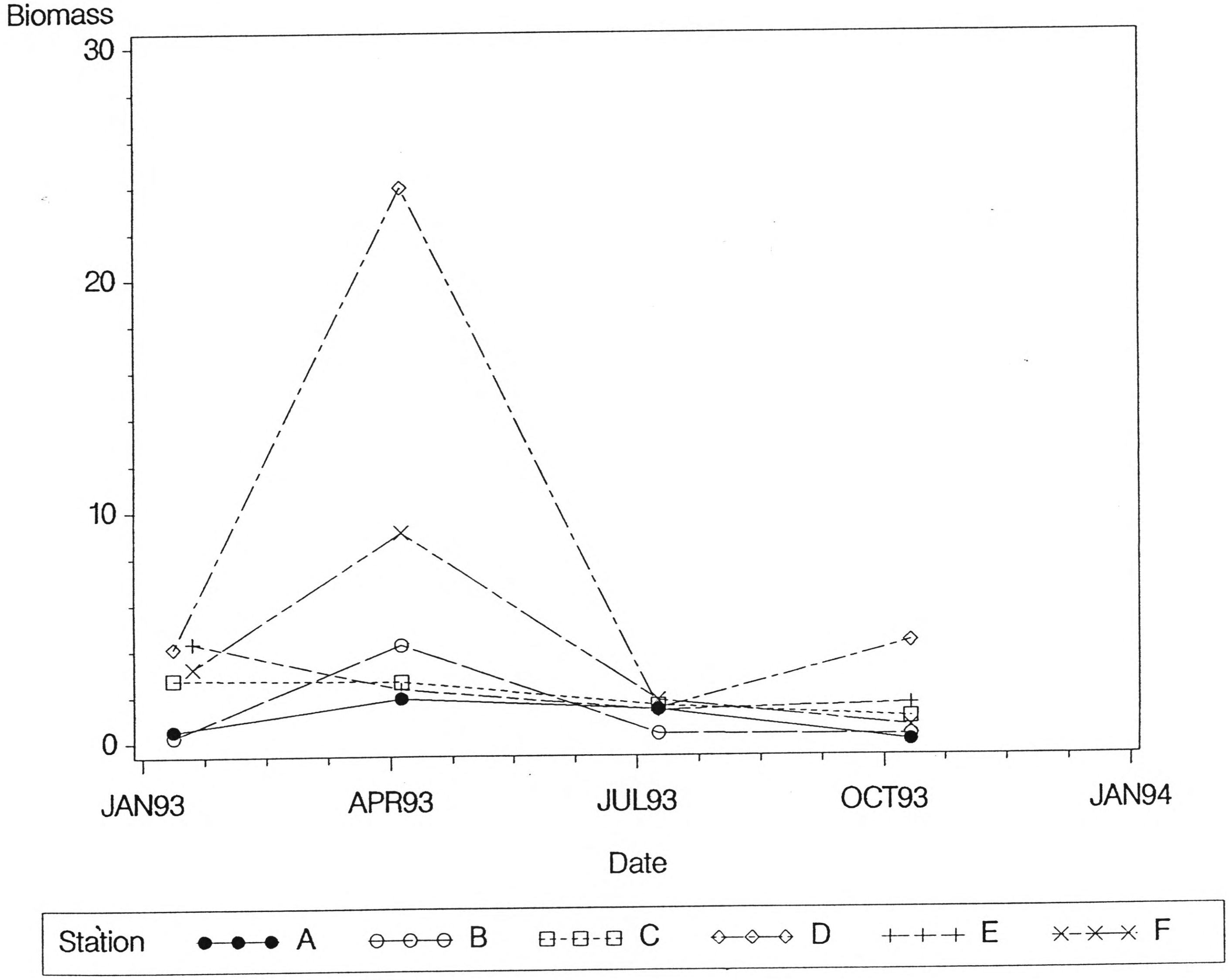


Figure 9. Relationships between macrofauna abundance and salinity in the Lavaca-Colorado Estuary. Average abundance (○) and salinity (□) at all stations.

Lavaca – Colorado Estuary

Macrofauna Abundance ($n \cdot m^{-2}$) and Salinity (ppt)

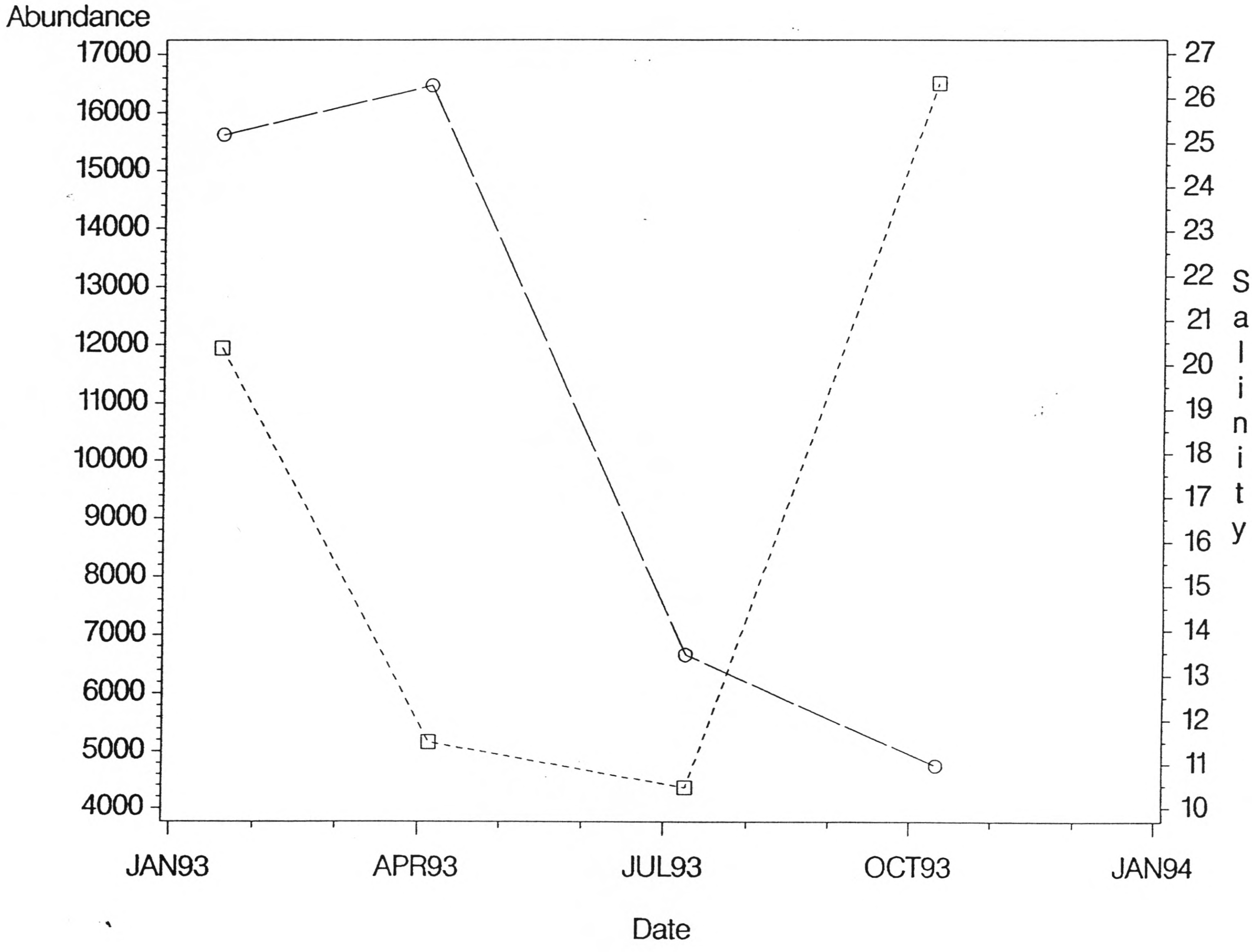


Figure 10. Relationships between macrofauna biomass and salinity in the Lavaca-Colorado Estuary. Average biomass (○) and salinity (□) at all stations.

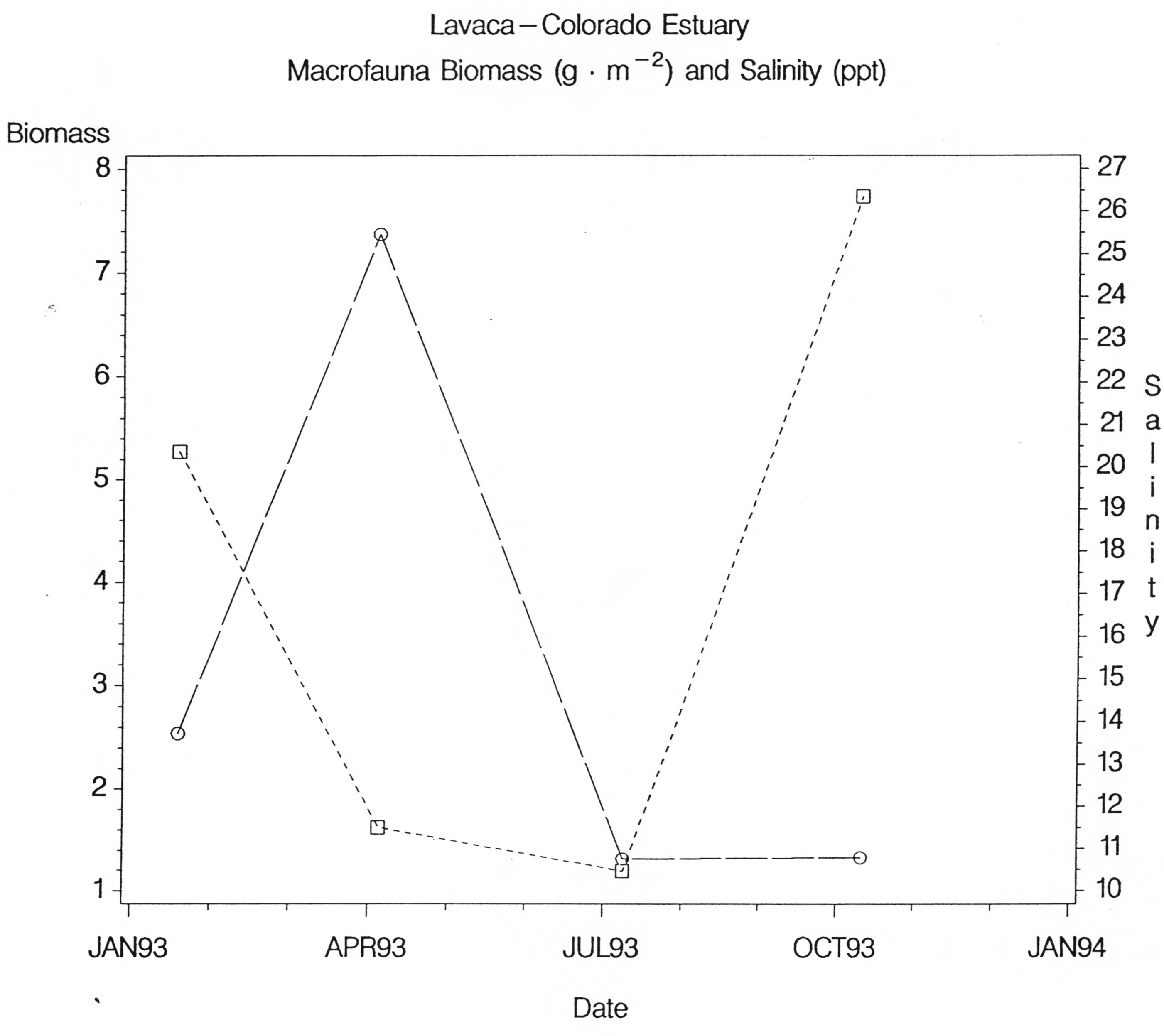

Lavaca – Colorado Estuary
Macrofauna Biomass (g · m⁻²) and Salinity (ppt)
Biomass
8
7
6
5
4
3
2
1
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
Salinity
JAN93
APR93
JUL93
OCT93
JAN94
Date

Figure 11. Macrofauna diversity over time at the six stations in the Lavaca-Colorado Estuary. Average diversity for n=3.

Lavaca – Colorado Estuary
Macrofauna Diversity (Hill's N1)

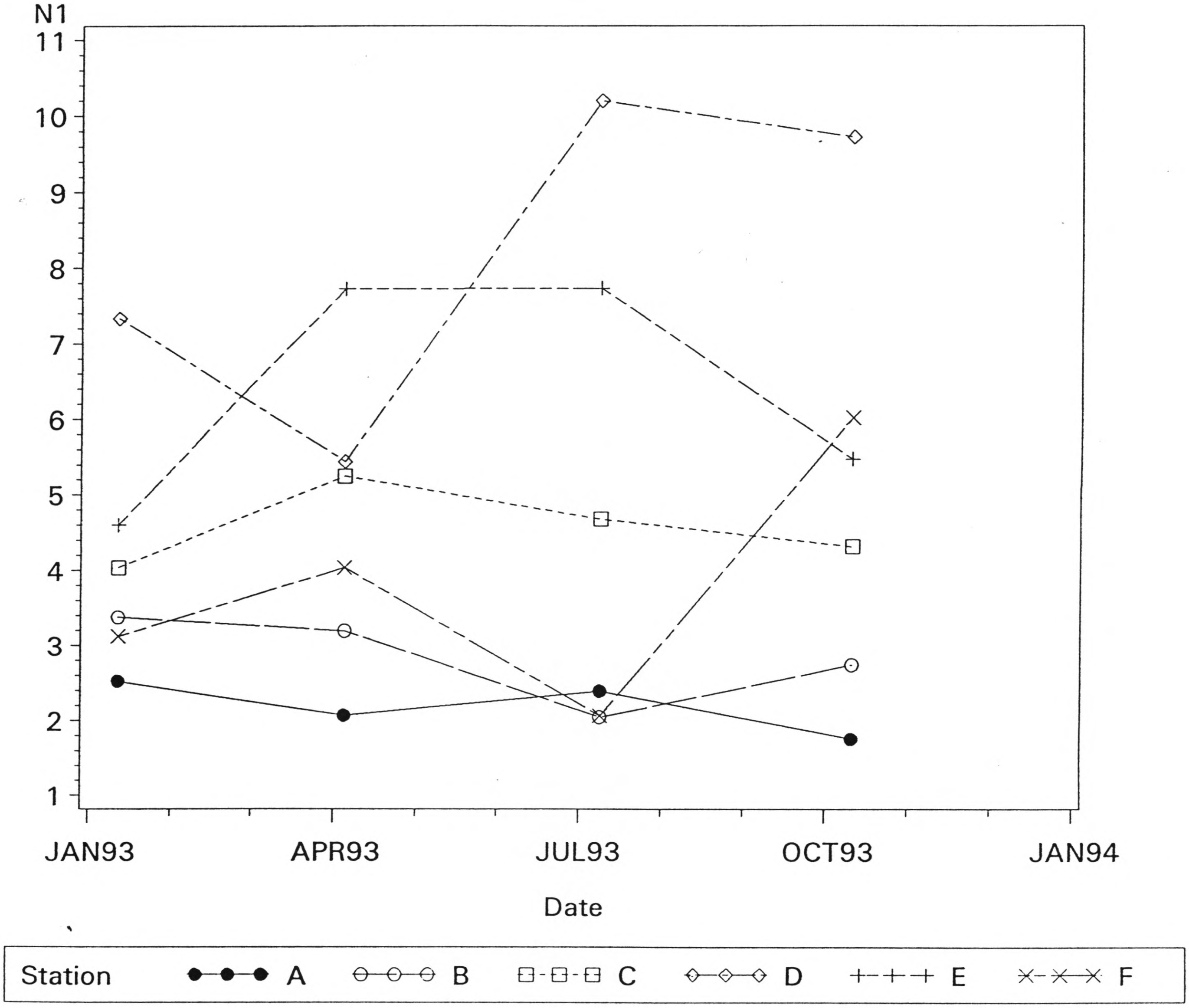
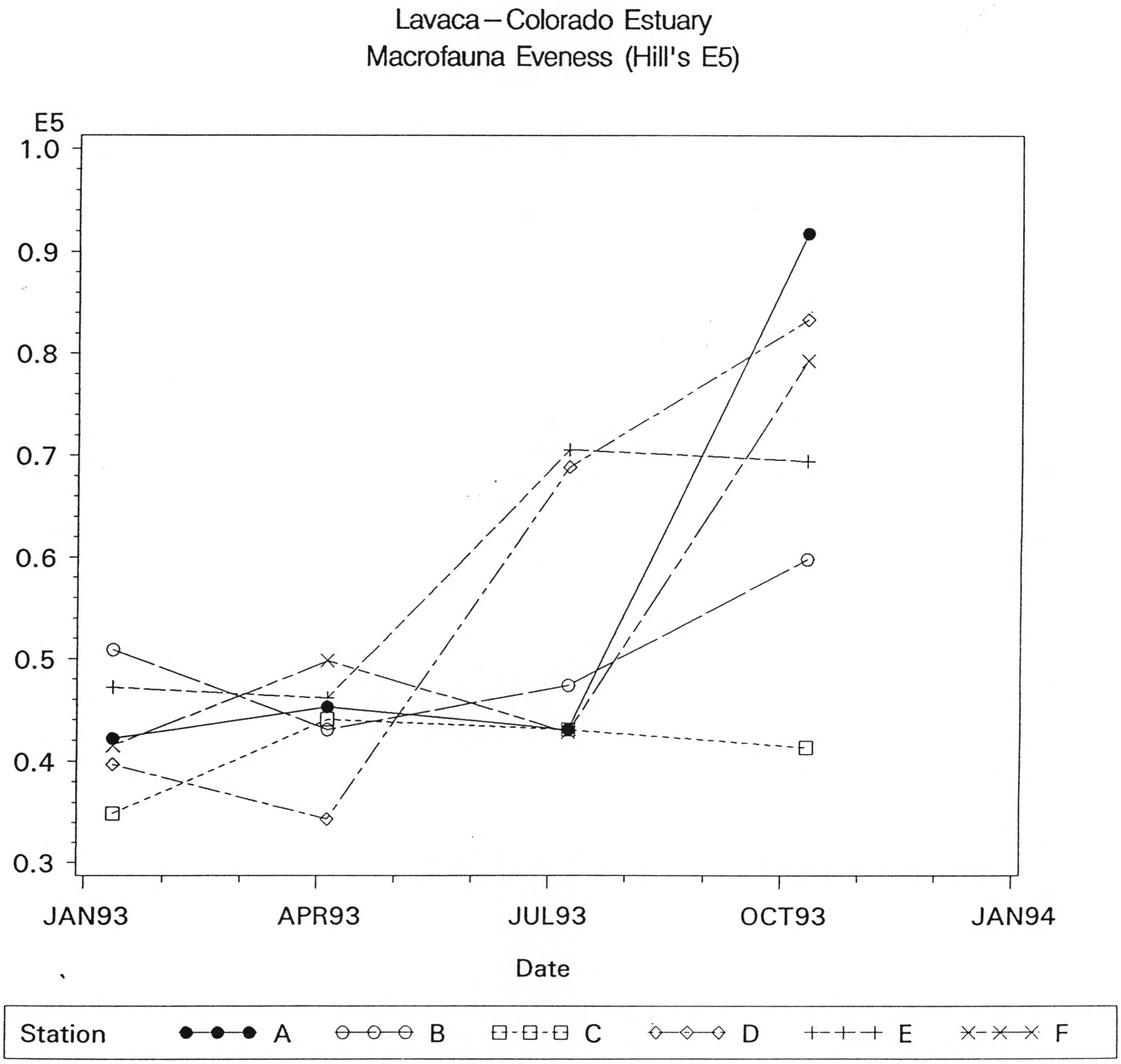


Figure 12. Macrofauna evenness at the six stations in the Lavaca-Colorado Estuary. Average evenness for n=3.



Lavaca – Colorado Estuary
Macrofauna Eveness (Hill's E5)
E5
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
JAN93
APR93
JUL93
OCT93
JAN94
Date
Station
A
B
C
D
E
F

Figure 13. Macrofauna dominance-diversity curves for the six stations in the Lavaca-Colorado Estuary. Sum of diversity for n=12.

Lavaca – Colorado Estuary
Dominance – Diversity Curves

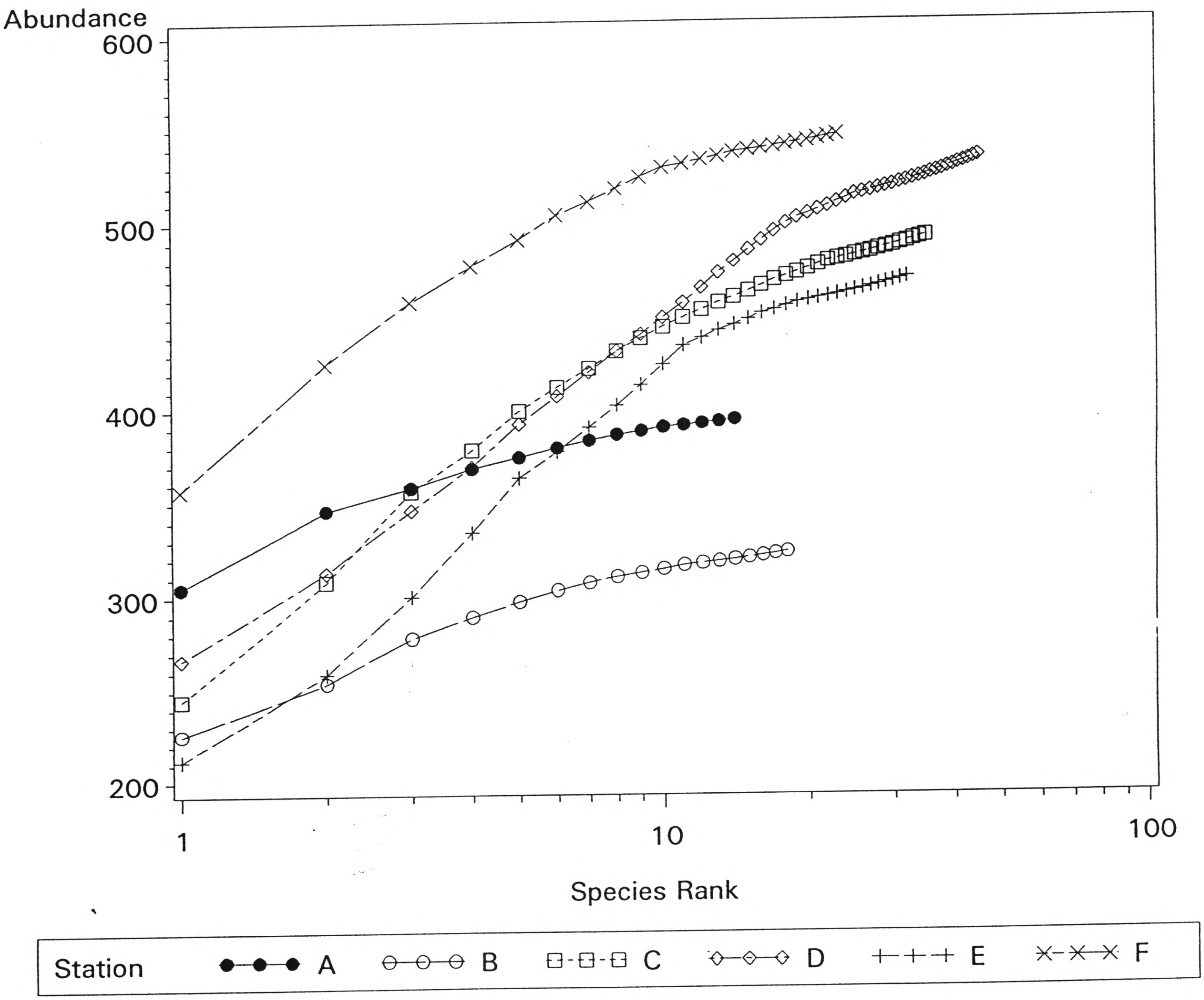


Figure 14. Cluster analysis on species data. Distance metric is the Pearson correlation coefficient single linkage method (nearest neighbor).

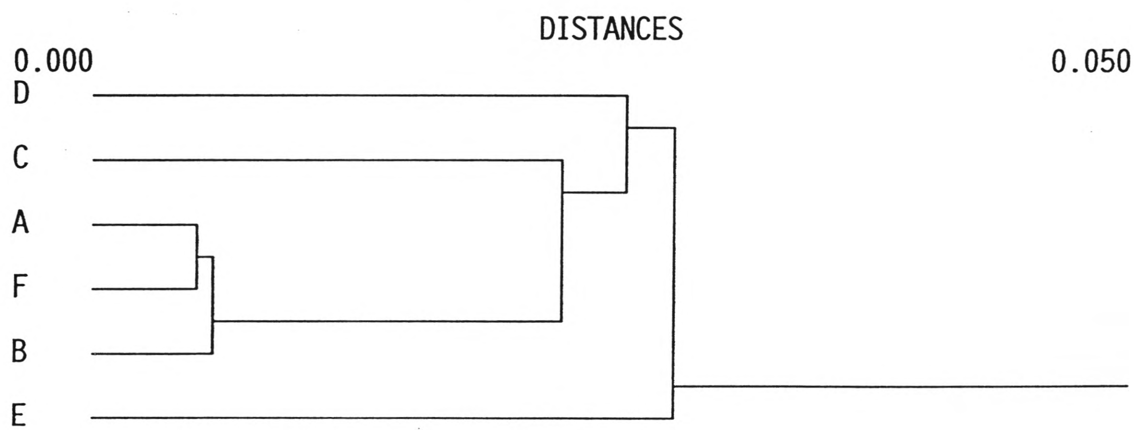
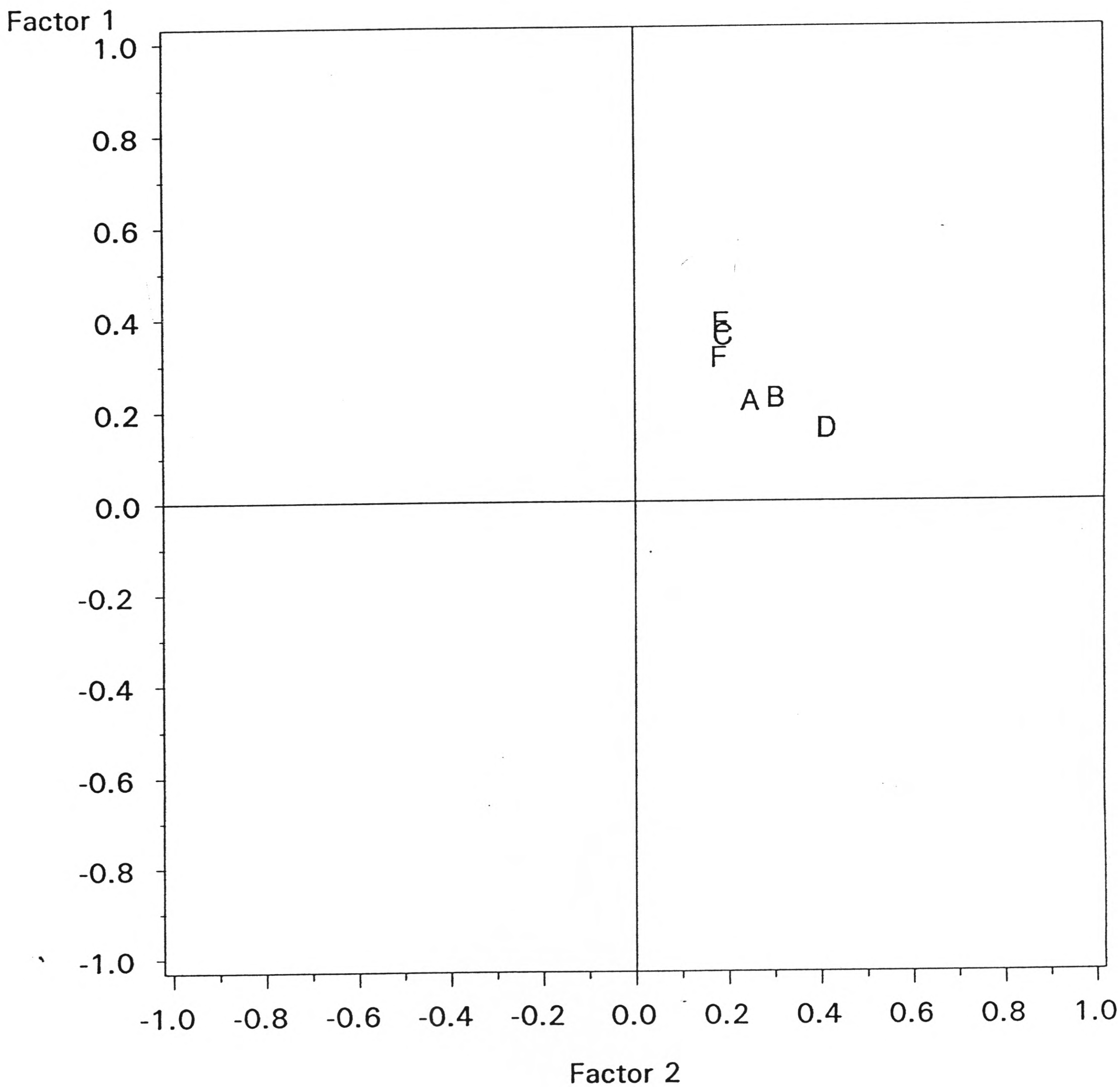


Figure 15. First two factors for macrofauna species at all sampling dates in the Lavaca-Colorado Estuary. Species occurring at all stations for all dates.

Lavaca–Colorado Estuary
Factor Analysis Using Promax Rotation



DISCUSSION

The Lavaca-Colorado Estuary is one of seven major estuarine systems along the Texas coast. This coastline has been affected by numerous human activities that have altered the hydrology, circulation and freshwater inflows to these ecosystems. Recently, water management plans have been designed to mitigate adverse effects due to previous projects and to enhance natural productivity to maintain healthy ecosystems. One such project is the Colorado River diversion. The accumulation of brush and logs forms rafts that trap sediment and promotes deltaic formations. The Colorado River Delta has been prograding since the 1930's. One consequence of the delta prograding is that river flow was diverted from Matagorda Bay directly to the Gulf of Mexico. Environmental managers have hypothesized that re-diversion of Colorado River inflow into Matagorda Bay would enhance bay productivity. In 1991 a diversion channel was built from the river to the bay. In 1992 a plug dam was built below the point of the diversion. Currently, heavy siltation is occurring at the diversion channel, which may eventually impede freshwater inflow into the east arm of Matagorda Bay.

Fresh water is flowing into Matagorda Bay from the diversion as evidenced by the salinity gradient from station F to E to D (annual average of 15.7, 21.4, and 27.1 ‰ respectively). This salinity gradient is similar to the gradient that is seen due to the Lavaca River from stations A to D (annual average of 10.9, 16.0, 19.3, and 27.1 ‰ respectively). The salinity gradients are of different magnitude because of the proximity of the marine water from the Gulf of Mexico through the Matagorda ship channel and the different sizes of the Lavaca Bay and the east arm of Matagorda Bay. Sediment texture is very similar among all stations studied, so differences in the biological responses among the stations is most likely due to the existing salinity gradients. The salinity gradients are due to freshwater inflow from the Lavaca and Colorado Rivers. A small amount inflow also enters the estuary via the Tres Palacios River, but this is a minor component and we did not align stations to study this inflow.

The freshwater diversion into Matagorda Bay could be successful in enhancing secondary productivity via a trophic cascade. Nutrients coming down the river stimulates primary production (Deegan *et al.*, 1986; Nixon *et al.*, 1986). The primary production is utilized as food for benthic animals (Montagna and Yoon, 1991). The enhanced food resources yield enhanced abundance and biomass of infauna (Kalke and Montagna, 1991; Montagna and Kalke, 1992). This cascade assumes that freshwater and low salinity do not have a negative physiological impact. Salinity stress on physiology (Finney, 1979), and hypoxia caused by algal blooms (Hull, 1987) could reduce benthic populations. The net effect of freshwater inflow is a function of the interaction between physical processes (i.e., sedimentation, resuspension, and advection), chemical processes (nutrient enrichment), and biological processes (i.e., enhanced productivity, recruitment gains, and losses via low-salinity intolerance). Benthos are a primary food source in Texas bays since the most desirable recreations species (e.g., red and black drum) are benthic feeders. The theory is that river inflow stimulates secondary production via a benthic food web which leads to desirable fish species.

Benthic biomass is a good indicator of secondary production (Banse and Mosher, 1980). Therefore, increased levels of benthic biomass indicate enhanced productivity.

Although salinity levels, and presumably freshwater inflow effects, are similar in Lavaca Bay and the east arm of Matagorda Bay, benthic biomass is much higher in the latter. Average benthic biomass in the east arm of Matagorda Bay was 3.05 $g{\cdot}m^{-2}$, which is nearly three times higher than 1.12 $g{\cdot}m^{-2}$, which is the average biomass in Lavaca Bay. Abundance is also higher in the east arm ($12,000{\cdot}m^{-2}$) than in Lavaca Bay ($8,500{\cdot}m^{-2}$). These data indicate that benthic productivity is probably higher in the east arm of Matagorda Bay than in Lavaca Bay.

The communities of the freshwater dominated areas (stations A, B, E, and F) have similar composition (Table 4, Figures 14 and 15). So, the differences in abundance and biomass are not due to different communities being present. However, there appears to be slightly more diversity and less dominance in the east arm of Matagorda Bay than in Lavaca Bay (Figure 13). High diversity and low dominance has been suggested to indicate healthy dynamic environments (Connell, 1978; Rhoads *et al*., 1978; Huston, 1979; Warwick, 1986). Based on these theoretical considerations, one could draw the conclusion that the east arm of the Matagorda Bay is a healthier environment than Lavaca Bay. The arm certainly has many desirable community characteristics including: high abundance, diversity and biomass. Benthic communities that are productive do support productive foodwebs.

It is tempting to conclude that the diversion project has had its desired effect. However, one must be cautioned that there is one confounding factor. Lavaca Bay has many channels and is surrounded by human development in the form of chemical plants, the fishing industry and residential communities. In this regard, the east end of Matagorda Bay is relatively undeveloped (with less obvious human impact). A longer term study coupled with an analysis of land use would clarify the relative roles of human development and the river diversion on estuarine community structure and productivity in the Lavaca-Colorado Estuary.

BIOGRAPHICAL SKETCH

Dr. Paul Montagna, P.I., has been working in benthic ecology since 1973. He is currently directing projects on benthic trophic dynamics and community ecology in Texas estuaries and in the Gulf of Mexico. Dr. Montagna has published more than 30 technical research articles, and received more than 15 research grants and contracts. Dr. Montagna has worked at the UTMSI since 1986 and is presently an Assistant Professor in the Department of Marine Science and Research Scientist at the Marine Science Institute. His area of research interest is benthic ecology. Dr. Montagna received his B.S. in biology from SUNY Stony Brook, a M.S. in biology from Northeastern University, and a Ph.D. in biology from the University of South Carolina.

Dr. Montagna is assisted by Mr. Rick Kalke, Research Associate. Mr. Kalke has been working on Texas benthos since 1975, and is an expert in the taxonomy in all dominant macrofaunal groups, and most meiofaunal groups.

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Table 1. Vertical distribution of macrofauna. Mean biomass (g·m^{-2}) and abundance (n·m^{-2}) of taxonomic categories.

Station	Taxa	Section 0-3 n·m^{-2} Mean	n·m^{-2} STD	g·m^{-2} Mean	g·m^{-2} STD	Section 3-10 n·m^{-2} Mean	n·m^{-2} STD	g·m^{-2} Mean	g·m^{-2} STD
A	Crustacea	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Chironomid larvae	47	110	0.0031	0.0072	24	82	0.0019	0.0066
	Mollusca	473	518	0.0430	0.0515	142	148	0.7034	1.0091
	Rhynchocoela	142	410	0.0057	0.0157	0	0	0.0000	0.0000
	Other	24	82	0.0014	0.0049	0	0	0.0000	0.0000
	Ophiuroidea	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Polychaeta	7871	6601	0.1489	0.1223	591	833	0.0534	0.1126
	Sipunculida	0	0	0.0000	0.0000	0	0	0.0000	0.0000
B	Crustacea	24	82	0.0028	0.0098	0	0	0.0000	0.0000
	Chironomid larvae	24	82	0.0017	0.0057	0	0	0.0000	0.0000
	Mollusca	473	597	0.2151	0.4714	24	82	0.0733	0.2538
	Rhynchocoela	95	185	0.0470	0.1576	95	185	0.1983	0.5697
	Other	0	0	0.0000	0.0000	95	328	0.0106	0.0368
	Ophiuroidea	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Polychaeta	5106	5722	0.3009	0.3995	1702	1209	0.4283	0.7933
	Sipunculida	0	0	0.0000	0.0000	0	0	0.0000	0.0000
C	Crustacea	284	436	0.0113	0.0153	0	0	0.0000	0.0000
	Chironomid larvae	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Mollusca	1560	2668	0.5673	0.8663	165	352	0.0180	0.0436
	Rhynchocoela	118	190	0.0066	0.0119	95	185	0.0097	0.0218
	Other	24	82	0.0163	0.0565	24	82	0.1052	0.3644
	Ophiuroidea	236	339	0.0870	0.2898	0	0	0.0000	0.0000
	Polychaeta	6831	7109	0.3137	0.1652	2269	1595	0.8084	0.7775
	Sipunculida	24	82	0.0558	0.1932	0	0	0.0000	0.0000
D	Crustacea	236	339	0.0357	0.1139	95	185	0.0600	0.1639
	Chironomid larvae	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Mollusca	544	859	0.0399	0.0620	260	352	0.0177	0.0306
	Rhynchocoela	260	283	0.0269	0.0587	284	342	0.3794	1.0972
	Other	118	190	0.0206	0.0441	24	82	4.3397	15.0331
	Ophiuroidea	331	887	0.7866	1.9112	213	323	1.4215	2.3657
	Polychaeta	8178	8212	0.4704	0.4640	2056	776	0.8757	0.9015
	Sipunculida	24	82	0.0014	0.0049	0	0	0.0000	0.0000

Table 1. Vertical distribution, continued.

E	Crustacea	47	110	0.0026	0.0063	0	0	0.0000	0.0000
	Chironomid larvae	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Mollusca	1182	1214	0.2276	0.2558	24	82	0.0017	0.0057
	Rhynchocoela	165	283	0.0208	0.0478	95	252	0.0104	0.0334
	Other	0	0	0.0000	0.0000	24	82	0.0232	0.0802
	Ophiruoidea	71	128	0.0087	0.0277	24	82	0.0007	0.0025
	Polychaeta	7280	5135	0.6758	0.7653	2198	653	1.4326	1.2819
	Sipunculida	0	0	0.0000	0.0000	0	0	0.0000	0.0000
F	Crustacea	189	389	0.0184	0.0379	0	0	0.0000	0.0000
	Chironomid larvae	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Mollusca	1135	1209	0.3947	0.6093	95	221	1.1764	2.7986
	Rhychocoela	118	146	0.0300	0.0737	189	304	0.3415	0.7235
	Other	142	353	0.0109	0.0319	47	164	0.0007	0.0025
	Ophiuroidea	0	0	0.0000	0.0000	0	0	0.0000	0.0000
	Polychaeta	8722	6535	0.4874	0.2729	2269	1908	1.2412	0.7158
	Sipuculida	0	0	0.0000	0.0000	0	0	0.0000	0.0000

Table 2. Estuary-wide macrofaunal taxa composition. Average abundance ($n \cdot m^{-2}$), biomass ($g \cdot m^{-2}$), and percent composition for 36 replicates to a depth of 10 cm.

Taxa	Abundance	STD	%	Biomass	STD	%
Polychaeta	9179	6948	84.4	1.206	1.167	38.4
Mollusca	1016	1478	9.4	0.583	1.522	18.6
Rhynchocoela	272	373	2.5	0.176	0.618	5.6
Ophiuroidea	146	452	1.3	0.384	1.430	12.2
Crustacea	146	319	1.3	0.022	0.084	0.7
Other	87	264	0.8	0.755	6.135	24.1
Chironomid larvae	16	65	0.2	0.001	0.005	0.1
Sipunculida	8	47	0.1	0.010	0.079	0.3
Total	10870		100.0	3.137		100.0

Table 3. Lavaca-Colorado Estuary macrofauna abundance and biomass. Average abundance ($n \cdot m^{-2}$) and biomass ($g \cdot m^{-2}$) for three replicates to a depth of 10 cm.

Date	Station	Abundance	STD	Biomass	STD
12JAN93	A	16262	7994	0.522	0.329
12JAN93	B	10022	3569	0.257	0.058
12JAN93	C	23164	7780	2.755	0.743
12JAN93	D	13142	9765	4.126	4.082
19JAN93	E	16167	5253	4.339	1.038
19JAN93	F	14938	6344	3.248	2.269
05APR93	A	12291	6973	1.904	1.302
05APR93	B	15506	8953	4.239	0.674
05APR93	C	8982	3546	2.641	0.624
05APR93	D	24582	5682	24.004	26.644
05APR93	E	14844	2379	2.297	1.058
05APR93	F	22597	3419	9.107	4.641
09JUL93	A	7564	2129	1.384	1.089
09JUL93	B	3120	1300	0.347	0.103
09JUL93	C	6146	3111	1.560	1.896
09JUL93	D	5862	1310	1.433	1.107
09JUL93	E	7469	1562	1.357	0.543
09JUL93	F	9738	1992	1.799	0.284
11OCT93	A	1135	1023	0.033	0.031
11OCT93	B	1891	1074	0.269	0.168
11OCT93	C	8226	4687	1.041	0.255
11OCT93	D	6902	1181	4.340	3.056
11OCT93	E	5956	1702	1.623	0.251
11OCT93	F	4349	996	0.651	0.599

Table 4. Lavaca-Colorado Estuary species list. Average density ($n \cdot m^{-2}$) over entire study period at each station.

Taxa	A	B	C	D	E	F
Cnidaria						
Anthozoa						
Anthozoa (unidentified)	95	0	95	473	95	95
Platyhelminthes						
Turbellaria						
Turbellaria (unidentified)	0	378	95	0	0	662
Rynchocoela						
Rhynchocoel (unidentified)	567	756	851	2175	1040	1229
Mollusca						
Gastropoda						
Caecidae						
Caecum johnsoni	0	0	378	0	95	0
Nassariidae						
Nassarius acutus	0	0	95	0	189	95
Pyramidellidae						
Pyramidella crenulata	0	0	0	0	945	95
Pyramidella sp.	0	95	0	0	0	0
Retusidae						
Acteocina canaliculata	0	0	0	0	284	95
Hydrobiidae						
Littoridina sphinctostoma	378	189	0	0	0	0
Pelecypoda						
Pelecypoda (unidentified)	0	0	0	851	0	95
Nuculanidae						
Nuculana acuta	0	0	0	0	284	0
Nuculana concentrica	0	0	189	95	95	0
Mytilidae						
Brachidontes exustus	0	95	0	0	0	95
Tellinidae						
Macoma mitchelli	1135	567	95	0	189	1324
Semelidae						
Abra aequalis	0	0	0	95	0	0
Corbulidae						
Corbula contracta	0	0	0	284	0	0
Lyonsiidae						
Lyonsia hyalina floridana	0	0	189	0	0	0
Sportellidae						
Aligena texasiana	0	0	0	95	0	0

Table 4. Species list by station, continued.

Mactridae						
Mulinia lateralis	945	1040	5956	0	2742	3120
Periplomatidae						
Periploma cf. *orbiculare*	0	0	0	567	0	0
Periploma margaritaceum	0	0	0	1229	0	0
Annelida						
Polychaeta						
Polynoidae						
Eunoe cf. *nodulosa*	0	0	0	95	0	0
Sigalionidae						
Sthenelais boa	0	0	0	189	0	0
Sigalionidae (unidentified)	0	0	95	0	0	0
Palmyridae(=Chrysopetalidae)						
Paleanotus heteroseta	0	0	0	95	0	0
Phyllodocidae						
Eteone heteropoda	0	0	95	0	0	0
Paranaitis speciosa	0	0	0	95	284	0
Pilargiidae						
Sigambra bassi	0	95	189	95	0	0
Sigambra tentaculata	0	0	95	473	95	0
Ancistrosyllis groenlandica	0	0	95	95	95	0
Parandalia ocularis	0	189	95	0	0	189
Sigambra cf. *wassi*	0	0	0	95	0	0
Hesionidae						
Gyptis vittata	0	0	473	189	1229	473
Nereidae						
Laeonereis culveri	95	0	0	0	0	0
Nereidae (unidentified)	0	0	0	0	95	0
Goniadidae						
Glycinde solitaria	189	284	1985	1040	1040	189
Onuphidae						
Diopatra cuprea	95	0	0	189	95	0
Lumbrineridae						
Lumbrineris parvapedata	0	0	0	189	95	0
Arabellidae						
Drilonereis magna	0	0	0	95	0	0
Dorvilleidae						
Dorvilleidae (unidentified)	0	0	189	0	0	0

Table 4. Species list by station, continued.

Spionidae						
Minuspio cirrifera	0	0	0	3120	0	0
Paraprionospio pinnata	0	95	284	378	3876	1796
Streblospio benedicti	3876	2647	4538	756	4444	6429
Magelonidae						
Magelona phyllisae	0	0	0	95	0	0
Chaetopteridae						
Spiochaetopterus costarum	0	0	567	0	0	95
Cossuridae						
Cossura delta	189	2269	2080	4349	1324	189
Orbiniidae						
Haploscoloplos foliosus	0	189	1229	0	0	189
Naineris sp.A	0	0	0	756	0	0
Paraonidae						
Paraonidae Grp.A	0	0	95	0	378	0
Paraonidae Grp.B	0	0	0	0	189	0
Opheliidae						
Armandia maculata	0	0	0	95	0	0
Capitellidae						
Capitella capitata	473	95	378	0	0	567
Mediomastus ambiseta	28837	21368	23164	25244	20044	33753
Maldanidae						
Branchioasychis americana	0	0	0	95	0	0
Clymenella torquata	0	0	0	189	0	0
Asychis sp.	0	0	0	0	95	0
Axiothella mucosa	0	0	284	0	0	0
Oweniidae						
Owenia fusiformis	0	0	0	95	0	0
Pectinariidae						
Pectinariidae (unidentified)	0	0	0	0	95	0
Pectinaria gouldii	0	0	284	567	95	0
Ampharetidae						
Melinna maculata	0	0	0	95	0	0
Hobsonia florida	95	0	0	756	3215	0
Oligochaeta						
Oligochaetes (unidentified)	0	0	189	1418	1135	95
Sipuncula						
Phascolion strombi	0	0	95	95	0	0

Table 4. Species list by station, continued.

Crustacea						
Copepoda						
Calanoida						
Diaptomidae						
Pseudodiaptomus coronatus	0	0	95	0	0	0
Malacostraca						
Reptantia						
Brachyuran Larvae						
Megalops	0	0	0	0	0	95
Cumacea						
Cyclaspis varians	0	0	662	0	0	0
Oxyurostylis sp.	0	0	284	0	95	0
Eudorella sp.	0	0	0	95	0	0
Amphipoda						
Ampeliscidae						
Ampelisca abdita	0	0	0	0	0	662
Oedicerotidae						
Monoculodes sp.	0	95	0	0	95	0
Corophiidae						
Microprotopus sp.	0	0	0	189	0	0
Caprellidae						
Caprellidae (unidentified)	0	0	0	95	0	0
Isopoda						
Munnidae						
Munna sp.	0	0	0	95	0	0
Idoteidae						
Edotea montosa	0	0	95	0	0	0
Tanaidacea						
Apseudidae						
Apseudes sp.A	0	0	0	851	0	0
Insecta						
Pterygota						
Diptera						
Chironomidae						
Chironomid larvae	284	95	0	0	0	0
Echinodermata						
Ophiuroidea						
Ophiuroidea (unidentified)	0	0	945	2175	378	0
Holothuroidea						
Holothuroidea (unidentified)	0	0	0	95	0	0

Table 5. Diversity measures of the Lavaca Estuary macrobenthos at each sampling date. Diveristy for entire estuary, including all samples taken at all stations.

Date	Station	Richness		Diversity		Eveness	
		N0	R1	H'	N1	E1	E5
12JAN93	A	10	1.7	0.93	2.5	0.402	0.422
12JAN93	B	10	1.9	1.22	3.4	0.529	0.509
12JAN93	C	22	3.8	1.40	4.0	0.452	0.349
12JAN93	D	24	4.7	1.99	7.3	0.627	0.397
12JAN93	E	14	2.5	1.53	4.6	0.578	0.472
12JAN93	F	12	2.2	1.14	3.1	0.458	0.415
05APR93	A	7	1.2	0.73	2.1	0.374	0.453
05APR93	B	12	2.2	1.16	3.2	0.468	0.430
05APR93	C	17	3.5	1.66	5.2	0.585	0.440
05APR93	D	28	4.9	1.69	5.4	0.508	0.343
05APR93	E	25	4.7	2.04	7.7	0.635	0.461
05APR93	F	13	2.2	1.40	4.0	0.544	0.498
09JUL93	A	7	1.4	0.87	2.4	0.449	0.431
09JUL93	B	5	1.1	0.72	2.0	0.445	0.474
09JUL93	C	13	2.9	1.54	4.7	0.602	0.431
09JUL93	D	17	3.9	2.32	10.2	0.820	0.688
09JUL93	E	13	2.7	2.05	7.7	0.797	0.705
09JUL93	F	7	1.3	0.73	2.1	0.373	0.428
11OCT93	A	2	0.4	0.56	1.8	0.811	0.917
11OCT93	B	5	1.3	1.01	2.7	0.627	0.598
11OCT93	C	12	2.5	1.46	4.3	0.589	0.413
11OCT93	D	16	3.5	2.27	9.7	0.820	0.833
11OCT93	E	11	2.4	1.70	5.5	0.709	0.694
11OCT93	F	10	2.4	1.79	6.0	0.779	0.793

Appendix I. Hydrographic measurements, continued.

Appendix I. Lavaca-Colorado Estuary hydrographic measurements. Abbreviations: STA=Station, Z=Depth, SAL(R)=Salinity by refractometer, SAL(M)=Salinty by meter, COND=Conductivity, TEMP=Temperature, DO=dissolved oxygen, and ORP=oxidation redox potential.

Date	STA	Z (m)	SAL(R) (ppt)	SAL(M) (ppt)	COND (uS/cm)	TEMP (°C)	pH	DO ($mg \cdot l^{-l}$)	ORP (mV)
12JAN93	A	0.00	2	2.9	6.07	11.49	7.78	11.33	0.318
12JAN93	A	1.10	2	16.0	27.00	12.07	7.62	8.77	0.330
12JAN93	B	0.00	5	7.5	13.52	10.88	7.76	11.52	0.305
12JAN93	B	1.70	5	21.0	34.00	12.81	7.66	9.03	0.312
12JAN93	C	0.00	20	20.3	32.20	11.69	7.72	10.44	0.306
12JAN93	C	2.80	20	21.3	33.90	11.90	7.70	9.62	0.307
12JAN93	D	0.00	22	23.2	36.60	12.53	7.85	10.30	0.294
12JAN93	D	4.00	22	27.2	42.10	14.30	7.73	7.92	0.297
19JAN93	E	0.00	18	20.1	32.00	14.42	8.34	9.30	0.175
19JAN93	E	3.10	18	22.2	35.20	14.46	8.38	8.16	0.195
19JAN93	F	0.00	12	13.9	22.90	15.93	8.70	10.08	0.168
19JAN93	F	1.20	12	14.6	24.00	15.99	8.74	9.37	0.187
05APR93	A	0.00	0	0.0	0.69	17.41	7.98	10.16	0.191
05APR93	A	1.10	0	0.0	0.70	17.38	8.01	10.06	0.194
05APR93	B	0.00	8	8.3	14.74	17.82	7.77	9.74	0.266
05APR93	B	1.80	8	10.4	18.30	17.72	7.78	8.88	0.266
05APR93	C	0.00	15	15.2	25.50	18.84	7.76	9.30	0.267
05APR93	C	2.80	15	15.3	25.50	18.85	7.78	8.83	0.265
05APR93	D	0.00	0	20.0	31.90	19.16	7.91	9.05	0.257
05APR93	D	3.90	0	20.9	33.50	19.02	7.91	8.35	0.257
05APR93	E	0.00	16	15.6	26.00	19.69	7.92	9.60	0.258
05APR93	E	3.20	16	16.9	27.70	19.22	7.90	8.40	0.259
05APR93	F	0.00	4	1.6	4.06	18.63	8.23	10.66	0.241
05APR93	F	1.00	4	5.6	11.48	17.55	7.97	9.32	0.256
09JUL93	A	0.00	3	0.8	2.45	28.09	8.03	7.03	0.216
09JUL93	A	1.10	3	0.8	2.51	28.12	8.12	6.85	0.218
09JUL93	B	0.00	2	0.0	1.05	28.37	7.78	6.85	0.239
09JUL93	B	1.80	2	1.7	4.20	28.12	8.08	6.53	0.230
09JUL93	C	0.00	8	5.6	10.44	28.60	7.95	6.88	0.230
09JUL93	C	2.90	8	5.6	10.46	28.59	7.97	6.75	0.229

Appendix I. Hydrographic measurements, continued.

09JUL93	D	0.00	13	11.3	19.40	28.53	8.10	7.27	0.232
09JUL93	D	4.10	13	28.0	43.70	27.80	7.35	1.92	0.264
09JUL93	E	0.00	12	11.0	18.80	29.18	8.04	7.30	0.219
09JUL93	E	3.30	12	13.4	22.90	28.94	7.80	4.57	0.231
09JUL93	F	0.00	12	10.4	18.00	29.69	8.02	7.29	0.225
09JUL93	F	1.10	12	13.3	23.60	28.27	7.90	5.94	0.235
11OCT93	A	0.00	18	16.6	27.10	23.37	8.06	7.05	0.230
11OCT93	A	1.30	18	19.4	31.80	24.31	8.04	6.07	0.235
11OCT93	B	0.00	22	20.4	32.80	23.74	8.03	7.64	0.241
11OCT93	B	2.20	22	23.3	37.00	24.96	8.11	6.34	0.260
11OCT93	C	0.00	28	26.1	40.90	25.06	8.10	7.03	0.262
11OCT93	C	3.20	28	28.2	43.80	25.90	8.10	5.56	0.269
11OCT93	D	0.00	28	26.9	42.00	26.11	8.03	7.23	0.224
11OCT93	D	4.60	28	29.3	45.20	25.49	8.11	6.09	0.241
11OCT93	E	0.00	32	29.3	45.10	25.64	8.18	6.41	0.228
11OCT93	E	3.70	32	29.4	45.40	25.48	8.18	5.97	0.230
11OCT93	F	0.00	28	26.1	40.90	24.90	8.20	7.50	0.232
11OCT93	F	1.60	28	28.5	44.50	25.04	8.20	6.74	0.234

Appendix II. Sediment grain size in the Lavaca-Colorado Estuary.

Date	Station	Depth (cm)	Rubble (%)	Sand (%)	Silt (%)	Clay (%)
14OCT91	A	0-3	0.012	0.019	0.738	0.231
14OCT91	A	3-10	0.003	0.259	0.528	0.211
14OCT91	B	0-3	0.001	0.188	0.442	0.369
14OCT91	B	3-10	0.003	0.280	0.244	0.473
14OCT91	C	0-3	0.020	0.281	0.568	0.132
14OCT91	C	3-10	0.013	0.345	0.210	0.432
14OCT91	D	0-3	0.008	0.157	0.262	0.573
14OCT91	D	3-10	0.004	0.031	0.852	0.112
19JAN93	E	0-3	0.009	0.083	0.161	0.746
19JAN93	E	3-10	0.017	0.065	0.201	0.717
19JAN93	F	0-3	0.014	0.122	0.342	0.522
19JAN93	F	3-10	0.017	0.108	0.428	0.447

Appendix III. Biomass data, continued.

Appendix III. Biomass data for major taxa from every sample. Abbreviations: STA=Station, REP=replicate, SEC=section depth where 3=0-3 cm and 10=3-10 cm.

Date	STA	REP	SEC	TAXA	n	$n \cdot m^{-2}$	mg	$g \cdot m^{-2}$
12JAN93	A	1	3	Polychaeta	42	11913	1.21	0.3432
12JAN93	A	1	3	Mollusca	4	1135	0.28	0.0794
12JAN93	A	1	10	Polychaeta	1	284	0.1	0.0284
12JAN93	A	1	3	Chironomid larvae	1	284	0.07	0.0199
12JAN93	A	2	3	Polychaeta	82	23258	1.29	0.3659
12JAN93	A	2	3	Mollusca	3	851	0.21	0.0596
12JAN93	A	2	10	Polychaeta	3	851	1.4	0.3971
12JAN93	A	2	10	Mollusca	1	284	0.18	0.0511
12JAN93	A	3	3	Polychaeta	32	9076	0.58	0.1645
12JAN93	A	3	3	Mollusca	3	851	0.2	0.0567
12JAN93	A	3	10	Polychaeta	0	0	0	0.0000
12JAN93	B	1	3	Polychaeta	17	4822	0.46	0.1305
12JAN93	B	1	3	Mollusca	3	851	0.15	0.0425
12JAN93	B	1	10	Polychaeta	2	567	0.06	0.0170
12JAN93	B	2	3	Polychaeta	39	11062	0.58	0.1645
12JAN93	B	2	3	Mollusca	3	851	0.11	0.0312
12JAN93	B	2	3	Rhynchocoela	1	284	0.02	0.0057
12JAN93	B	2	10	Polychaeta	4	1135	0.32	0.0908
12JAN93	B	3	3	Polychaeta	33	9360	0.85	0.2411
12JAN93	B	3	3	Crustacea	1	284	0.12	0.0340
12JAN93	B	3	3	Mollusca	1	284	0.03	0.0085
12JAN93	B	3	10	Polychaeta	2	567	0.02	0.0057
12JAN93	C	1	3	Polychaeta	85	24109	0.74	0.2099
12JAN93	C	1	3	Crustacea	2	567	0.11	0.0312
12JAN93	C	1	3	Mollusca	3	851	3.11	0.8821
12JAN93	C	1	3	Rhynchocoela	1	284	0.08	0.0227
12JAN93	C	1	3	Ophiuroidea	3	851	0.06	0.0170
12JAN93	C	1	10	Polychaeta	18	5106	3.88	1.1005
12JAN93	C	1	10	Other	1	284	4.45	1.2622
12JAN93	C	2	3	Polychaeta	51	14466	2.51	0.7119
12JAN93	C	2	3	Crustacea	2	567	0.06	0.0170
12JAN93	C	2	3	Rhynchocoela	1	284	0.03	0.0085
12JAN93	C	2	10	Polychaeta	8	2269	4.6	1.3047
12JAN93	C	3	3	Polychaeta	49	13898	1.24	0.3517
12JAN93	C	3	3	Mollusca	1	284	0.05	0.0142

Appendix III. Biomass data, continued.

12JAN93	C	3	3	Rhynchocoela	2	567	0.04	0.0113
12JAN93	C	3	3	Ophiuroidea	3	851	3.55	1.0069
12JAN93	C	3	3	Sipunculida	1	284	2.36	0.6694
12JAN93	C	3	10	Polychaeta	12	3404	2.01	0.5701
12JAN93	C	3	10	Rhynchocoela	2	567	0.26	0.0737
12JAN93	D	1	3	Polychaeta	55	15600	5.14	1.4579
12JAN93	D	1	3	Mollusca	10	2836	0.56	0.1588
12JAN93	D	1	3	Crustacea	1	284	0.02	0.0057
12JAN93	D	1	3	Rhynchocoela	3	851	0.05	0.0142
12JAN93	D	1	3	Ophiuroidea	11	3120	21.38	6.0642
12JAN93	D	1	10	Polychaeta	4	1135	1.05	0.2978
12JAN93	D	1	10	Ophiuroidea	1	284	2.53	0.7176
12JAN93	D	2	3	Polychaeta	13	3687	2.63	0.7460
12JAN93	D	2	3	Rhynchocoela	1	284	0.05	0.0142
12JAN93	D	2	10	Polychaeta	5	1418	0.5	0.1418
12JAN93	D	3	3	Polychaeta	23	6524	1.23	0.3489
12JAN93	D	3	3	Crustacea	2	567	1.4	0.3971
12JAN93	D	3	3	Rhynchocoela	2	567	0.04	0.0113
12JAN93	D	3	3	Ophiuroidea	1	284	0.2	0.0567
12JAN93	D	3	3	Other	1	284	0.09	0.0255
12JAN93	D	3	10	Polychaeta	6	1702	6.77	1.9202
19JAN93	E	1	3	Polychaeta	61	17302	9.06	2.5698
19JAN93	E	1	3	Mollusca	2	567	0.06	0.0170
19JAN93	E	1	3	Rhynchocoela	2	567	0.05	0.0142
19JAN93	E	1	3	Ophiuroidea	1	284	0.02	0.0057
19JAN93	E	1	10	Polychaeta	8	2269	4.91	1.3927
19JAN93	E	1	10	Rhynchocoela	1	284	0.03	0.0085
19JAN93	E	1	10	Ophiuroidea	1	284	0.03	0.0085
19JAN93	E	2	3	Polychaeta	42	11913	1.79	0.5077
19JAN93	E	2	3	Mollusca	2	567	0.1	0.0284
19JAN93	E	2	10	Polychaeta	12	3404	17.5	4.9637
19JAN93	E	3	3	Polychaeta	31	8793	3.65	1.0353
19JAN93	E	3	3	Ophiuroidea	1	284	0.01	0.0028
19JAN93	E	3	10	Polychaeta	7	1985	8.68	2.4620
19JAN93	F	1	3	Polychaeta	26	7375	2.01	0.5701
19JAN93	F	1	3	Mollusca	4	1135	0.1	0.0284
19JAN93	F	1	10	Polychaeta	3	851	6.96	1.9741
19JAN93	F	2	3	Polychaeta	60	17018	3.28	0.9303
19JAN93	F	2	3	Mollusca	9	2553	2.37	0.6722
19JAN93	F	2	3	Rhynchocoela	1	284	0.9	0.2553

Appendix III. Biomass data, continued.

19JAN93	F	2	3	Other	2	567	0.39	0.1106
19JAN93	F	2	10	Polychaeta	3	851	5.49	1.5572
19JAN93	F	2	10	Rhynchocoela	2	567	7.94	2.2521
19JAN93	F	3	3	Polychaeta	38	10778	1.76	0.4992
19JAN93	F	3	3	Mollusca	6	1702	0.74	0.2099
19JAN93	F	3	10	Polychaeta	4	1135	2.41	0.6836
05APR93	A	1	3	Polychaeta	48	13615	0.92	0.2609
05APR93	A	1	3	Mollusca	1	284	0.22	0.0624
05APR93	A	1	3	Rhynchocoela	1	284	0.05	0.0142
05APR93	A	1	3	Other	1	284	0.06	0.0170
05APR93	A	1	10	Polychaeta	4	1135	0.16	0.0454
05APR93	A	1	10	Mollusca	1	284	3.95	1.1204
05APR93	A	2	3	Polychaeta	13	3687	0.48	0.1361
05APR93	A	2	10	Polychaeta	1	284	0.04	0.0113
05APR93	A	2	10	Mollusca	1	284	2.43	0.6892
05APR93	A	3	3	Polychaeta	43	12197	0.74	0.2099
05APR93	A	3	3	Rhynchocoela	5	1418	0.19	0.0539
05APR93	A	3	10	Polychaeta	10	2836	0.37	0.1049
05APR93	A	3	10	Mollusca	1	284	10.53	2.9867
05APR93	B	1	3	Polychaeta	60	17018	2.44	0.6921
05APR93	B	1	3	Mollusca	7	1985	4.64	1.3161
05APR93	B	1	10	Polychaeta	16	4538	1.75	0.4964
05APR93	B	1	10	Mollusca	1	284	3.1	0.8793
05APR93	B	1	10	Rhynchocoela	1	284	0.79	0.2241
05APR93	B	2	3	Polychaeta	41	11629	3.6	1.0211
05APR93	B	2	3	Mollusca	2	567	3.96	1.1232
05APR93	B	2	3	Rhynchocoela	1	284	1.93	0.5474
05APR93	B	2	10	Polychaeta	8	2269	0.49	0.1390
05APR93	B	2	10	Rhynchocoela	1	284	7.02	1.9912
05APR93	B	2	10	Other	4	1135	0.45	0.1276
05APR93	B	3	3	Polychaeta	11	3120	3.86	1.0949
05APR93	B	3	10	Polychaeta	9	2553	10.22	2.8988
05APR93	B	3	10	Rhynchocoela	2	567	0.58	0.1645
05APR93	C	1	3	Polychaeta	4	1135	0.71	0.2014
05APR93	C	1	3	Crustacea	1	284	0.07	0.0199
05APR93	C	1	3	Mollusca	33	9360	10.19	2.8903
05APR93	C	1	10	Polychaeta	4	1135	0.58	0.1645
05APR93	C	1	10	Mollusca	2	567	0.13	0.0369
05APR93	C	2	3	Polychaeta	7	1985	0.6	0.1702
05APR93	C	2	3	Crustacea	5	1418	0.15	0.0425

Appendix III. Biomass data, continued.

05APR93	C	2	3	Mollusca	11	3120	2.51	0.7119
05APR93	C	2	10	Polychaeta	8	2269	5.56	1.5770
05APR93	C	2	10	Mollusca	1	284	0.1	0.0284
05APR93	C	3	3	Polychaeta	3	851	0.65	0.1844
05APR93	C	3	3	Crustacea	2	567	0.09	0.0255
05APR93	C	3	3	Mollusca	10	2836	5.18	1.4693
05APR93	C	3	10	Polychaeta	4	1135	1.41	0.3999
05APR93	D	1	3	Polychaeta	85	24109	3.96	1.1232
05APR93	D	1	3	Crustacea	1	284	0.02	0.0057
05APR93	D	1	3	Mollusca	1	284	0.02	0.0057
05APR93	D	1	3	Rhynchocoela	1	284	0.04	0.0113
05APR93	D	1	3	Other	1	284	0.12	0.0340
05APR93	D	1	10	Polychaeta	12	3404	9.5	2.6946
05APR93	D	1	10	Rhynchocoela	1	284	0.74	0.2099
05APR93	D	1	10	Ophiuroidea	4	1135	25.38	7.1988
05APR93	D	2	3	Polychaeta	72	20422	2.81	0.7970
05APR93	D	2	3	Rhynchocoela	1	284	0.23	0.0652
05APR93	D	2	3	Ophiuroidea	1	284	0.1	0.0284
05APR93	D	2	3	Sipunculida	1	284	0.06	0.0170
05APR93	D	2	3	Other	2	567	0.54	0.1532
05APR93	D	2	10	Polychaeta	7	1985	4.2	1.1913
05APR93	D	2	10	Rhynchocoela	4	1135	13.58	3.8518
05APR93	D	3	3	Polychaeta	51	14466	1.56	0.4425
05APR93	D	3	3	Crustacea	1	284	0.02	0.0057
05APR93	D	3	3	Mollusca	1	284	0.04	0.0113
05APR93	D	3	10	Polychaeta	12	3404	7.36	2.0876
05APR93	D	3	10	Other	1	284	183.6	52.076
05APR93	E	1	3	Polychaeta	37	10495	2.11	0.5985
05APR93	E	1	3	Crustacea	1	284	0.04	0.0113
05APR93	E	1	3	Mollusca	2	567	1.25	0.3545
05APR93	E	1	3	Rhynchocoela	3	851	0.57	0.1617
05APR93	E	1	10	Polychaeta	5	1418	2.54	0.7204
05APR93	E	2	3	Polychaeta	34	9644	2.33	0.6609
05APR93	E	2	3	Mollusca	5	1418	1.49	0.4226
05APR93	E	2	3	Rhynchocoela	1	284	0.22	0.0624
05APR93	E	2	10	Polychaeta	6	1702	0.41	0.1163
05APR93	E	2	10	Other	1	284	0.98	0.2780
05APR93	E	3	3	Polychaeta	44	12480	5.81	1.6479
05APR93	E	3	3	Crustacea	1	284	0.07	0.0199
05APR93	E	3	3	Mollusca	5	1418	2.13	0.6042

Appendix III. Biomass data, continued.

05APR93	E	3	3	Ophiuroidea	1	284	0.34	0.0964
05APR93	E	3	10	Polychaeta	8	2269	3.6	1.0211
05APR93	E	3	10	Rhynchocoela	3	851	0.41	0.1163
05APR93	F	1	3	Polychaeta	47	13331	1.78	0.5049
05APR93	F	1	3	Mollusca	12	3404	6.72	1.9061
05APR93	F	1	3	Other	4	1135	0.07	0.0199
05APR93	F	1	10	Polychaeta	12	3404	8.77	2.4875
05APR93	F	1	10	Mollusca	2	567	29.29	8.3078
05APR93	F	1	10	Rhynchocoela	2	567	1.7	0.4822
05APR93	F	1	10	Other	2	567	0.03	0.0085
05APR93	F	2	3	Polychaeta	46	13047	1.76	0.4992
05APR93	F	2	3	Mollusca	8	2269	3.68	1.0438
05APR93	F	2	3	Rhynchocoela	1	284	0.12	0.0340
05APR93	F	2	10	Polychaeta	9	2553	5.28	1.4976
05APR93	F	2	10	Rhynchocoela	3	851	4.8	1.3615
05APR93	F	3	3	Polychaeta	77	21840	3.05	0.8651
05APR93	F	3	3	Mollusca	7	1985	3.02	0.8566
05APR93	F	3	10	Polychaeta	4	1135	5.76	1.6338
05APR93	F	3	10	Mollusca	2	567	20.48	5.8089
05APR93	F	3	10	Rhynchocoela	1	284	0.01	0.0028
09JUL93	A	1	3	Polychaeta	15	4255	0.2	0.0567
09JUL93	A	1	3	Mollusca	3	851	0.17	0.0482
09JUL93	A	1	10	Chironomid larvae	1	284	0.08	0.0227
09JUL93	A	2	3	Polychaeta	25	7091	0.36	0.1021
09JUL93	A	2	3	Mollusca	5	1418	0.62	0.1759
09JUL93	A	2	3	Chironomid larvae	1	284	0.06	0.0170
09JUL93	A	2	10	Polychaeta	2	567	0.03	0.0085
09JUL93	A	2	10	Mollusca	1	284	5.92	1.6791
09JUL93	A	3	3	Polychaeta	21	5956	0.17	0.0482
09JUL93	A	3	3	Mollusca	1	284	0.12	0.0340
09JUL93	A	3	10	Polychaeta	4	1135	0.16	0.0454
09JUL93	A	3	10	Mollusca	1	284	6.75	1.9146
09JUL93	B	1	3	Polychaeta	4	1135	0.3	0.0851
09JUL93	B	1	3	Chironomid larvae	1	284	0.07	0.0199
09JUL93	B	1	10	Polychaeta	2	567	0.44	0.1248
09JUL93	B	2	3	Mollusca	3	851	0.2	0.0567
09JUL93	B	2	10	Polychaeta	7	1985	1.28	0.3631
09JUL93	B	3	3	Polychaeta	6	1702	0.28	0.0794
09JUL93	B	3	10	Polychaeta	10	2836	1.1	0.3120
09JUL93	C	1	3	Polychaeta	12	3404	0.73	0.2071

Appendix III. Biomass data, continued.

09JUL93	C	1	10	Polychaeta	1	284	0.34	0.0964
09JUL93	C	2	3	Polychaeta	11	3120	0.53	0.1503
09JUL93	C	2	3	Mollusca	2	567	0.98	0.2780
09JUL93	C	2	10	Polychaeta	5	1418	0.73	0.2071
09JUL93	C	3	3	Polychaeta	22	6240	1.12	0.3177
09JUL93	C	3	3	Mollusca	2	567	1.72	0.4879
09JUL93	C	3	10	Polychaeta	5	1418	9.74	2.7627
09JUL93	C	3	10	Mollusca	4	1135	0.53	0.1503
09JUL93	C	3	10	Rhynchocoela	1	284	0.08	0.0227
09JUL93	D	1	3	Polychaeta	7	1985	0.48	0.1361
09JUL93	D	1	3	Crustacea	1	284	0.02	0.0057
09JUL93	D	1	3	Mollusca	1	284	0.02	0.0057
09JUL93	D	1	3	Other	1	284	0.12	0.0340
09JUL93	D	1	10	Polychaeta	5	1418	2.09	0.5928
09JUL93	D	1	10	Crustacea	2	567	1.98	0.5616
09JUL93	D	1	10	Mollusca	1	284	0.08	0.0227
09JUL93	D	2	3	Polychaeta	3	851	0.11	0.0312
09JUL93	D	2	3	Crustacea	4	1135	0.03	0.0085
09JUL93	D	2	10	Polychaeta	7	1985	0.29	0.0823
09JUL93	D	2	10	Crustacea	1	284	0.54	0.1532
09JUL93	D	2	10	Mollusca	2	567	0.06	0.0170
09JUL93	D	2	10	Rhynchocoela	1	284	0.26	0.0737
09JUL93	D	3	3	Polychaeta	15	4255	0.79	0.2241
09JUL93	D	3	3	Mollusca	1	284	0.57	0.1617
09JUL93	D	3	10	Polychaeta	5	1418	2.03	0.5758
09JUL93	D	3	10	Mollusca	3	851	0.31	0.0879
09JUL93	D	3	10	Rhynchocoela	1	284	0.72	0.2042
09JUL93	D	3	10	Ophiuroidea	1	284	4.66	1.3218
09JUL93	E	1	3	Polychaeta	10	2836	2.33	0.6609
09JUL93	E	1	3	Mollusca	11	3120	0.28	0.0794
09JUL93	E	1	10	Polychaeta	5	1418	0.62	0.1759
09JUL93	E	2	3	Polychaeta	11	3120	0.24	0.0681
09JUL93	E	2	3	Mollusca	14	3971	2.68	0.7602
09JUL93	E	2	10	Polychaeta	7	1985	4	1.1346
09JUL93	E	3	3	Polychaeta	8	2269	0.19	0.0539
09JUL93	E	3	3	Mollusca	5	1418	0.71	0.2014
09JUL93	E	3	3	Rhynchocoela	1	284	0.04	0.0113
09JUL93	E	3	10	Polychaeta	7	1985	3.26	0.9247
09JUL93	F	1	3	Polychaeta	15	4255	1.69	0.4794
09JUL93	F	1	3	Rhynchocoela	1	284	0.23	0.0652

Appendix III. Biomass data, continued.

09JUL93	F	1	10	Polychaeta	19	5389	4.56	1.2934
09JUL93	F	2	3	Polychaeta	7	1985	1.45	0.4113
09JUL93	F	2	10	Polychaeta	20	5673	5.82	1.6508
09JUL93	F	3	3	Polychaeta	26	7375	2.58	0.7318
09JUL93	F	3	3	Mollusca	1	284	0.02	0.0057
09JUL93	F	3	10	Polychaeta	14	3971	2.68	0.7602
11OCT93	A	1	3	Polychaeta	5	1418	0.13	0.0369
11OCT93	A	1	10	Polychaeta	0	0	0	0.0000
11OCT93	A	2	3	Polychaeta	7	1985	0.22	0.0624
11OCT93	A	2	10	Polychaeta	0	0	0	0.0000
11OCT93	A	3	3	Polychaeta	0	0	0	0.0000
11OCT93	A	3	10	Polychaeta	0	0	0	0.0000
11OCT93	B	1	3	Polychaeta	1	284	0.01	0.0028
11OCT93	B	1	3	Mollusca	1	284	0.01	0.0028
11OCT93	B	1	10	Polychaeta	3	851	0.87	0.2468
11OCT93	B	2	3	Polychaeta	3	851	0.24	0.0681
11OCT93	B	2	3	Rhynchocoela	2	567	0.04	0.0113
11OCT93	B	2	10	Polychaeta	6	1702	1.29	0.3659
11OCT93	B	3	3	Polychaeta	1	284	0.11	0.0312
11OCT93	B	3	10	Polychaeta	3	851	0.28	0.0794
11OCT93	C	1	3	Polychaeta	16	4538	1.27	0.3602
11OCT93	C	1	3	Rhynchocoela	1	284	0.13	0.0369
11OCT93	C	1	3	Ophiuroidea	1	284	0.02	0.0057
11OCT93	C	1	10	Polychaeta	12	3404	1.44	0.4084
11OCT93	C	2	3	Polychaeta	23	6524	1.7	0.4822
11OCT93	C	2	3	Mollusca	2	567	0.04	0.0113
11OCT93	C	2	3	Ophiuroidea	2	567	0.04	0.0113
11OCT93	C	2	10	Polychaeta	17	4822	2.79	0.7914
11OCT93	C	2	10	Rhynchocoela	1	284	0.07	0.0199
11OCT93	C	3	3	Polychaeta	6	1702	1.47	0.4170
11OCT93	C	3	3	Mollusca	2	567	0.22	0.0624
11OCT93	C	3	3	Ophiuroidea	1	284	0.01	0.0028
11OCT93	C	3	3	Other	1	284	0.69	0.1957
11OCT93	C	3	10	Polychaeta	2	567	1.12	0.3177
11OCT93	D	1	3	Polychaeta	8	2269	0.79	0.2241
11OCT93	D	1	3	Rhynchocoela	1	284	0.01	0.0028
11OCT93	D	1	10	Polychaeta	10	2836	2.75	0.7800
11OCT93	D	1	10	Crustacea	1	284	0.02	0.0057
11OCT93	D	1	10	Rhynchocoela	2	567	0.71	0.2014
11OCT93	D	1	10	Ophiuroidea	1	284	18.51	5.2502

Appendix III. Biomass data, continued.

11OCT93	D	2	3	Polychaeta	10	2836	0.22	0.0624
11OCT93	D	2	3	Mollusca	4	1135	0.18	0.0511
11OCT93	D	2	3	Rhynchocoela	2	567	0.72	0.2042
11OCT93	D	2	3	Ophiuroidea	1	284	11.6	3.2902
11OCT93	D	2	10	Polychaeta	6	1702	0.31	0.0879
11OCT93	D	2	10	Mollusca	3	851	0.26	0.0737
11OCT93	D	2	10	Rhynchocoela	2	567	0.03	0.0085
11OCT93	D	2	10	Ophiuroidea	1	284	6.84	1.9401
11OCT93	D	3	3	Polychaeta	4	1135	0.18	0.0511
11OCT93	D	3	3	Mollusca	5	1418	0.3	0.0851
11OCT93	D	3	10	Polychaeta	8	2269	0.2	0.0567
11OCT93	D	3	10	Mollusca	2	567	0.04	0.0113
11OCT93	D	3	10	Rhynchocoela	1	284	0.01	0.0028
11OCT93	D	3	10	Ophiuroidea	1	284	2.22	0.6297
11OCT93	E	1	3	Polychaeta	10	2836	0.33	0.0936
11OCT93	E	1	3	Mollusca	2	567	0.75	0.2127
11OCT93	E	1	10	Polychaeta	9	2553	4.41	1.2509
11OCT93	E	2	3	Polychaeta	13	3687	0.51	0.1447
11OCT93	E	2	3	Mollusca	1	284	0.07	0.0199
11OCT93	E	2	10	Polychaeta	12	3404	4.33	1.2282
11OCT93	E	2	10	Mollusca	1	284	0.07	0.0199
11OCT93	E	3	3	Polychaeta	7	1985	0.24	0.0681
11OCT93	E	3	3	Mollusca	1	284	0.11	0.0312
11OCT93	E	3	10	Polychaeta	7	1985	6.35	1.8011
11OCT93	F	1	3	Polychaeta	6	1702	0.46	0.1305
11OCT93	F	1	3	Crustacea	4	1135	0.36	0.1021
11OCT93	F	1	10	Polychaeta	5	1418	3.84	1.0892
11OCT93	F	2	3	Polychaeta	12	3404	0.35	0.0993
11OCT93	F	2	3	Crustacea	3	851	0.33	0.0936
11OCT93	F	2	3	Rhynchocoela	1	284	0.01	0.0028
11OCT93	F	2	10	Polychaeta	3	851	0.94	0.2666
11OCT93	F	3	3	Polychaeta	9	2553	0.45	0.1276
11OCT93	F	3	3	Crustacea	1	284	0.09	0.0255
11OCT93	F	3	3	Mollusca	1	284	0.05	0.0142
11OCT93	F	3	3	Rhynchocoela	1	284	0.01	0.0028
11OCT93	F	3	10	Polychaeta	0	0	0	0.0000

Appendix IV. Abundance data for species from every sample. Abbreviations: STA=Station, REP=replicate, SEC=section depth where 3=0-3 cm and 10=3-10 cm, N=$n \cdot \text{sample}^{-1}$.

DATE	STA	REP	SEC	SPECIES	N
12JAN93	A	1	3	Macoma mitchelli	3
12JAN93	A	1	3	Mulinia lateralis	1
12JAN93	A	1	3	Streblospio benedicti	7
12JAN93	A	1	3	Cossura delta	1
12JAN93	A	1	3	Capitella capitata	1
12JAN93	A	1	3	Mediomastus ambiseta	33
12JAN93	A	1	3	Chironomid larvae	1
12JAN93	A	1	10	Glycinde solitaria	1
12JAN93	A	2	3	Macoma mitchelli	2
12JAN93	A	2	3	Mulinia lateralis	1
12JAN93	A	2	3	Diopatra cuprea	1
12JAN93	A	2	3	Streblospio benedicti	4
12JAN93	A	2	3	Cossura delta	1
12JAN93	A	2	3	Capitella capitata	3
12JAN93	A	2	3	Mediomastus ambiseta	73
12JAN93	A	2	10	Mulinia lateralis	1
12JAN93	A	2	10	Laeonereis culveri	1
12JAN93	A	2	10	Glycinde solitaria	1
12JAN93	A	2	10	Mediomastus ambiseta	1
12JAN93	A	3	3	Macoma mitchelli	2
12JAN93	A	3	3	Mulinia lateralis	1
12JAN93	A	3	3	Streblospio benedicti	6
12JAN93	A	3	3	Mediomastus ambiseta	26
12JAN93	A	3	10	No species observed	0
12JAN93	B	1	3	Pyramidella sp.	1
12JAN93	B	1	3	Mulinia lateralis	2
12JAN93	B	1	3	Streblospio benedicti	4
12JAN93	B	1	3	Cossura delta	1
12JAN93	B	1	3	Haploscoloplos foliosus	1
12JAN93	B	1	3	Mediomastus ambiseta	11
12JAN93	B	1	10	Mediomastus ambiseta	2
12JAN93	B	2	3	Rhynchocoel (unidentified)	1
12JAN93	B	2	3	Macoma mitchelli	3
12JAN93	B	2	3	Glycinde solitaria	1
12JAN93	B	2	3	Streblospio benedicti	8

Appendix IV. Species data, continued.

12JAN93	B	2	3	Cossura delta	2
12JAN93	B	2	3	Mediomastus ambiseta	28
12JAN93	B	2	10	Mediomastus ambiseta	4
12JAN93	B	3	3	Macoma mitchelli	1
12JAN93	B	3	3	Streblospio benedicti	5
12JAN93	B	3	3	Cossura delta	4
12JAN93	B	3	3	Haploscoloplos foliosus	1
12JAN93	B	3	3	Mediomastus ambiseta	23
12JAN93	B	3	3	Monoculodes sp.	1
12JAN93	B	3	10	Cossura delta	1
12JAN93	B	3	10	Mediomastus ambiseta	1
12JAN93	C	1	3	Rhynchocoel (unidentified)	1
12JAN93	C	1	3	Nassarius acutus	1
12JAN93	C	1	3	Lyonsia hyalina floridana	1
12JAN93	C	1	3	Mulinia lateralis	1
12JAN93	C	1	3	Sigalionidae (unidentified)	1
12JAN93	C	1	3	Glycinde solitaria	6
12JAN93	C	1	3	Streblospio benedicti	2
12JAN93	C	1	3	Cossura delta	3
12JAN93	C	1	3	Haploscoloplos foliosus	1
12JAN93	C	1	3	Mediomastus ambiseta	71
12JAN93	C	1	3	Axiothella mucosa	1
12JAN93	C	1	3	Pseudodiaptomus coronatus	1
12JAN93	C	1	3	Cyclaspis varians	1
12JAN93	C	1	3	Ophiuroidea (unidentified)	3
12JAN93	C	1	10	Turbellaria (unidentified)	1
12JAN93	C	1	10	Glycinde solitaria	1
12JAN93	C	1	10	Cossura delta	2
12JAN93	C	1	10	Haploscoloplos foliosus	4
12JAN93	C	1	10	Mediomastus ambiseta	11
12JAN93	C	2	3	Rhynchocoel (unidentified)	1
12JAN93	C	2	3	Eteone heteropoda	1
12JAN93	C	2	3	Gyptis vittata	1
12JAN93	C	2	3	Glycinde solitaria	6
12JAN93	C	2	3	Cossura delta	1
12JAN93	C	2	3	Haploscoloplos foliosus	2
12JAN93	C	2	3	Mediomastus ambiseta	37
12JAN93	C	2	3	Axiothella mucosa	1
12JAN93	C	2	3	Pectinaria gouldii	1
12JAN93	C	2	3	Oligochaetes (unidentified)	1

Appendix IV. Species data, continued.

12JAN93	C	2	3	Cyclaspis varians	1
12JAN93	C	2	3	Oxyurostylis sp.	1
12JAN93	C	2	10	Glycinde solitaria	1
12JAN93	C	2	10	Cossura delta	1
12JAN93	C	2	10	Haploscoloplos foliosus	2
12JAN93	C	2	10	Paraonidae Grp. A	1
12JAN93	C	2	10	Mediomastus ambiseta	3
12JAN93	C	3	3	Rhynchocoel (unidentified)	2
12JAN93	C	3	3	Mulinia lateralis	1
12JAN93	C	3	3	Gyptis vittata	1
12JAN93	C	3	3	Glycinde solitaria	3
12JAN93	C	3	3	Streblospio benedicti	2
12JAN93	C	3	3	Cossura delta	3
12JAN93	C	3	3	Mediomastus ambiseta	39
12JAN93	C	3	3	Pectinaria gouldii	1
12JAN93	C	3	3	Phascolion strombi	1
12JAN93	C	3	3	Ophiuroidea (unidentified)	3
12JAN93	C	3	10	Rhynchocoel (unidentified)	2
12JAN93	C	3	10	Cossura delta	4
12JAN93	C	3	10	Mediomastus ambiseta	8
12JAN93	D	1	3	Rhynchocoel (unidentified)	3
12JAN93	D	1	3	Pelecypoda (unidentified)	8
12JAN93	D	1	3	Nuculana concentrica	1
12JAN93	D	1	3	Corbula contracta	1
12JAN93	D	1	3	Eunoe cf. nodulosa	1
12JAN93	D	1	3	Sthenelais boa	1
12JAN93	D	1	3	Glycinde solitaria	2
12JAN93	D	1	3	Minuspio cirrifera	4
12JAN93	D	1	3	Streblospio benedicti	1
12JAN93	D	1	3	Cossura delta	3
12JAN93	D	1	3	Mediomastus ambiseta	41
12JAN93	D	1	3	Pectinaria gouldii	1
12JAN93	D	1	3	Melinna maculata	1
12JAN93	D	1	3	Munna sp.	1
12JAN93	D	1	3	Ophiuroidea (unidentified)	11
12JAN93	D	1	10	Sigambra tentaculata	1
12JAN93	D	1	10	Mediomastus ambiseta	3
12JAN93	D	1	10	Ophiuroidea (unidentified)	1
12JAN93	D	2	3	Rhynchocoel (unidentified)	1
12JAN93	D	2	3	Sthenelais boa	1

Appendix IV. Species data, continued.

12JAN93	D	2	3	Sigambra tentaculata	1
12JAN93	D	2	3	Glycinde solitaria	2
12JAN93	D	2	3	Mediomastus ambiseta	9
12JAN93	D	2	10	Naineris sp. A	3
12JAN93	D	2	10	Mediomastus ambiseta	2
12JAN93	D	3	3	Anthozoa (unidentified)	1
12JAN93	D	3	3	Rhynchocoel (unidentified)	2
12JAN93	D	3	3	Glycinde solitaria	2
12JAN93	D	3	3	Drilonereis magna	1
12JAN93	D	3	3	Cossura delta	5
12JAN93	D	3	3	Mediomastus ambiseta	14
12JAN93	D	3	3	Oligochaetes (unidentified)	1
12JAN93	D	3	3	Apseudes sp. A	2
12JAN93	D	3	3	Ophiuroidea (unidentified)	1
12JAN93	D	3	10	Sigambra cf. wassi	1
12JAN93	D	3	10	Mediomastus ambiseta	3
12JAN93	D	3	10	Clymenella torquata	1
12JAN93	D	3	10	Owenia fusiformis	1
12JAN93	E	1	3	Rhynchocoel (unidentified)	2
12JAN93	E	1	3	Pyramidella crenulata	1
12JAN93	E	1	3	Nuculana concentrica	1
12JAN93	E	1	3	Gyptis vittata	1
12JAN93	E	1	3	Paraprionospio pinnata	2
12JAN93	E	1	3	Streblospio benedicti	10
12JAN93	E	1	3	Mediomastus ambiseta	47
12JAN93	E	1	3	Oligochaetes (unidentified)	1
12JAN93	E	1	3	Ophiuroidea (unidentified)	1
12JAN93	E	1	10	Rhynchocoel (unidentified)	1
12JAN93	E	1	10	Gyptis vittata	1
12JAN93	E	1	10	Paraprionospio pinnata	2
12JAN93	E	1	10	Streblospio benedicti	1
12JAN93	E	1	10	Cossura delta	2
12JAN93	E	1	10	Mediomastus ambiseta	2
12JAN93	E	1	10	Ophiuroidea (unidentified)	1
12JAN93	E	2	3	Pyramidella crenulata	2
12JAN93	E	2	3	Streblospio benedicti	7
12JAN93	E	2	3	Cossura delta	2
12JAN93	E	2	3	Mediomastus ambiseta	31
12JAN93	E	2	3	Asychis sp.	1
12JAN93	E	2	3	Oligochaetes (unidentified)	1

Appendix IV. Species data, continued.

12JAN93	E	2	10	Gyptis vittata	2
12JAN93	E	2	10	Glycinde solitaria	1
12JAN93	E	2	10	Paraprionospio pinnata	8
12JAN93	E	2	10	Paraonidae Grp. A	1
12JAN93	E	3	3	Glycinde solitaria	3
12JAN93	E	3	3	Paraprionospio pinnata	4
12JAN93	E	3	3	Streblospio benedicti	4
12JAN93	E	3	3	Paraonidae Grp. B	1
12JAN93	E	3	3	Mediomastus ambiseta	19
12JAN93	E	3	3	Ophiuroidea (unidentified)	1
12JAN93	E	3	10	Glycinde solitaria	3
12JAN93	E	3	10	Paraprionospio pinnata	1
12JAN93	E	3	10	Streblospio benedicti	1
12JAN93	E	3	10	Paraonidae Grp. A	1
12JAN93	E	3	10	Mediomastus ambiseta	1
12JAN93	F	1	3	Macoma mitchelli	2
12JAN93	F	1	3	Mulinia lateralis	2
12JAN93	F	1	3	Streblospio benedicti	1
12JAN93	F	1	3	Mediomastus ambiseta	25
12JAN93	F	1	10	Paraprionospio pinnata	1
12JAN93	F	1	10	Cossura delta	1
12JAN93	F	1	10	Mediomastus ambiseta	1
12JAN93	F	2	3	Anthozoa (unidentified)	1
12JAN93	F	2	3	Turbellaria (unidentified)	1
12JAN93	F	2	3	Rhynchocoel (unidentified)	1
12JAN93	F	2	3	Macoma mitchelli	3
12JAN93	F	2	3	Mulinia lateralis	6
12JAN93	F	2	3	Streblospio benedicti	3
12JAN93	F	2	3	Haploscoloplos foliosus	2
12JAN93	F	2	3	Mediomastus ambiseta	55
12JAN93	F	2	10	Rhynchocoel (unidentified)	2
12JAN93	F	2	10	Gyptis vittata	1
12JAN93	F	2	10	Paraprionospio pinnata	1
12JAN93	F	2	10	Mediomastus ambiseta	1
12JAN93	F	3	3	Macoma mitchelli	2
12JAN93	F	3	3	Mulinia lateralis	4
12JAN93	F	3	3	Paraprionospio pinnata	1
12JAN93	F	3	3	Streblospio benedicti	7
12JAN93	F	3	3	Mediomastus ambiseta	30
12JAN93	F	3	10	Paraprionospio pinnata	1

Appendix IV. Species data, continued.

12JAN93	F	3	10	Mediomastus ambiseta	2
12JAN93	F	3	10	Oligochaetes (unidentified)	1
05APR93	A	1	3	Anthozoa (unidentified)	1
05APR93	A	1	3	Rhynchocoel (unidentified)	1
05APR93	A	1	3	Mulinia lateralis	1
05APR93	A	1	3	Streblospio benedicti	4
05APR93	A	1	3	Mediomastus ambiseta	44
05APR93	A	1	10	Macoma mitchelli	1
05APR93	A	1	10	Mediomastus ambiseta	4
05APR93	A	2	3	Streblospio benedicti	4
05APR93	A	2	3	Mediomastus ambiseta	9
05APR93	A	2	10	Macoma mitchelli	1
05APR93	A	2	10	Mediomastus ambiseta	1
05APR93	A	3	3	Rhynchocoel (unidentified)	5
05APR93	A	3	3	Streblospio benedicti	4
05APR93	A	3	3	Mediomastus ambiseta	38
05APR93	A	3	3	Hobsonia florida	1
05APR93	A	3	10	Macoma mitchelli	1
05APR93	A	3	10	Mediomastus ambiseta	10
05APR93	B	1	3	Brachidontes exustus	1
05APR93	B	1	3	Mulinia lateralis	6
05APR93	B	1	3	Streblospio benedicti	7
05APR93	B	1	3	Cossura delta	2
05APR93	B	1	3	Capitella capitata	1
05APR93	B	1	3	Mediomastus ambiseta	50
05APR93	B	1	10	Rhynchocoel (unidentified)	1
05APR93	B	1	10	Macoma mitchelli	1
05APR93	B	1	10	Glycinde solitaria	1
05APR93	B	1	10	Cossura delta	8
05APR93	B	1	10	Mediomastus ambiseta	7
05APR93	B	2	3	Rhynchocoel (unidentified)	1
05APR93	B	2	3	Mulinia lateralis	2
05APR93	B	2	3	Sigambra bassi	1
05APR93	B	2	3	Streblospio benedicti	2
05APR93	B	2	3	Mediomastus ambiseta	38
05APR93	B	2	10	Turbellaria (unidentified)	4
05APR93	B	2	10	Rhynchocoel (unidentified)	1
05APR93	B	2	10	Cossura delta	1
05APR93	B	2	10	Mediomastus ambiseta	7
05APR93	B	3	3	Cossura delta	1

Appendix IV. Species data, continued.

05APR93	B	3	3	Mediomastus ambiseta	10
05APR93	B	3	10	Rhynchocoel (unidentified)	2
05APR93	B	3	10	Paraprionospio pinnata	1
05APR93	B	3	10	Cossura delta	4
05APR93	B	3	10	Mediomastus ambiseta	4
05APR93	C	1	3	Nuculana concentrica	1
05APR93	C	1	3	Mulinia lateralis	32
05APR93	C	1	3	Glycinde solitaria	2
05APR93	C	1	3	Mediomastus ambiseta	2
05APR93	C	1	3	Edotea montosa	1
05APR93	C	1	10	Lyonsia hyalina floridana	1
05APR93	C	1	10	Mulinia lateralis	1
05APR93	C	1	10	Glycinde solitaria	1
05APR93	C	1	10	Cossura delta	2
05APR93	C	1	10	Mediomastus ambiseta	1
05APR93	C	2	3	Mulinia lateralis	11
05APR93	C	2	3	Capitella capitata	1
05APR93	C	2	3	Mediomastus ambiseta	5
05APR93	C	2	3	Pectinaria gouldii	1
05APR93	C	2	3	Cyclaspis varians	4
05APR93	C	2	3	Oxyurostylis sp.	1
05APR93	C	2	10	Mulinia lateralis	1
05APR93	C	2	10	Sigambra tentaculata	1
05APR93	C	2	10	Dorvilleidae	2
05APR93	C	2	10	Streblospio benedicti	1
05APR93	C	2	10	Mediomastus ambiseta	4
05APR93	C	3	3	Nuculana concentrica	1
05APR93	C	3	3	Mulinia lateralis	9
05APR93	C	3	3	Glycinde solitaria	1
05APR93	C	3	3	Haploscoloplos foliosus	1
05APR93	C	3	3	Mediomastus ambiseta	1
05APR93	C	3	3	Cyclaspis varians	1
05APR93	C	3	3	Oxyurostylis sp.	1
05APR93	C	3	10	Sigambra bassi	1
05APR93	C	3	10	Gyptis vittata	1
05APR93	C	3	10	Mediomastus ambiseta	2
05APR93	D	1	3	Anthozoa (unidentified)	1
05APR93	D	1	3	Rhynchocoel (unidentified)	1
05APR93	D	1	3	Aligena texasiana	1
05APR93	D	1	3	Glycinde solitaria	5

Appendix IV. Species data, continued.

05APR93	D	1	3	Minuspio cirrifera	4
05APR93	D	1	3	Streblospio benedicti	1
05APR93	D	1	3	Cossura delta	6
05APR93	D	1	3	Mediomastus ambiseta	52
05APR93	D	1	3	Branchioasychis americana	1
05APR93	D	1	3	Clymenella torquata	1
05APR93	D	1	3	Pectinaria gouldii	5
05APR93	D	1	3	Hobsonia florida	6
05APR93	D	1	3	Oligochaetes (unidentified)	4
05APR93	D	1	3	Caprellid	1
05APR93	D	1	10	Rhynchocoel (unidentified)	1
05APR93	D	1	10	Sigambra tentaculata	1
05APR93	D	1	10	Diopatra cuprea	1
05APR93	D	1	10	Lumbrineris parvapedata	1
05APR93	D	1	10	Minuspio cirrifera	4
05APR93	D	1	10	Mediomastus ambiseta	4
05APR93	D	1	10	Oligochaetes (unidentified)	1
05APR93	D	1	10	Ophiuroidea (unidentified)	4
05APR93	D	2	3	Anthozoa (unidentified)	2
05APR93	D	2	3	Rhynchocoel (unidentified)	1
05APR93	D	2	3	Ancistrosyllis groenlandica	1
05APR93	D	2	3	Minuspio cirrifera	2
05APR93	D	2	3	Cossura delta	7
05APR93	D	2	3	Mediomastus ambiseta	61
05APR93	D	2	3	Hobsonia florida	1
05APR93	D	2	3	Phascolion strombi	1
05APR93	D	2	3	Ophiuroidea (unidentified)	1
05APR93	D	2	10	Rhynchocoel (unidentified)	4
05APR93	D	2	10	Gyptis vittata	1
05APR93	D	2	10	Minuspio cirrifera	2
05APR93	D	2	10	Naineris sp. A	1
05APR93	D	2	10	Mediomastus ambiseta	2
05APR93	D	2	10	Oligochaetes (unidentified)	1
05APR93	D	3	3	Pelecypoda (unidentified)	1
05APR93	D	3	3	Paranaitis speciosa	1
05APR93	D	3	3	Minuspio cirrifera	1
05APR93	D	3	3	Streblospio benedicti	4
05APR93	D	3	3	Cossura delta	8
05APR93	D	3	3	Mediomastus ambiseta	36
05APR93	D	3	3	Hobsonia florida	1

Appendix IV. Species data, continued.

05APR93	D	3	3	Microprotopus spp.	1
05APR93	D	3	10	Sigambra bassi	1
05APR93	D	3	10	Sigambra tentaculata	1
05APR93	D	3	10	Magelona phyllisae	1
05APR93	D	3	10	Cossura delta	3
05APR93	D	3	10	Mediomastus ambiseta	6
05APR93	D	3	10	Holothuroid (unidentified)	1
05APR93	E	1	3	Rhynchocoel (unidentified)	3
05APR93	E	1	3	Acteocina canaliculata	1
05APR93	E	1	3	Mulinia lateralis	1
05APR93	E	1	3	Paranaitis speciosa	1
05APR93	E	1	3	Glycinde solitaria	1
05APR93	E	1	3	Paraprionospio pinnata	1
05APR93	E	1	3	Streblospio benedicti	1
05APR93	E	1	3	Mediomastus ambiseta	25
05APR93	E	1	3	Hobsonia florida	8
05APR93	E	1	3	Monoculodes sp.	1
05APR93	E	1	10	Gyptis vittata	1
05APR93	E	1	10	Paraprionospio pinnata	2
05APR93	E	1	10	Paraonidae Grp. A	1
05APR93	E	1	10	Hobsonia florida	1
05APR93	E	2	3	Rhynchocoel (unidentified)	1
05APR93	E	2	3	Acteocina canaliculata	1
05APR93	E	2	3	Nuculana acuta	2
05APR93	E	2	3	Mulinia lateralis	1
05APR93	E	2	3	Gyptis vittata	1
05APR93	E	2	3	Nereidae (unidentified)	1
05APR93	E	2	3	Diopatra cuprea	1
05APR93	E	2	3	Cossura delta	1
05APR93	E	2	3	Mediomastus ambiseta	17
05APR93	E	2	3	Pectinariidae	1
05APR93	E	2	3	Hobsonia florida	12
05APR93	E	2	3	Oligochaetes (unidentified)	1
05APR93	E	2	10	Anthozoa (unidentified)	1
05APR93	E	2	10	Sigambra tentaculata	1
05APR93	E	2	10	Cossura delta	1
05APR93	E	2	10	Mediomastus ambiseta	4
05APR93	E	3	3	Pyramidella crenulata	3
05APR93	E	3	3	Nuculana acuta	1
05APR93	E	3	3	Mulinia lateralis	1

Appendix IV. Species data, continued.

05APR93	E	3	3	Paranaitis speciosa	2
05APR93	E	3	3	Paraprionospio pinnata	3
05APR93	E	3	3	Streblospio benedicti	2
05APR93	E	3	3	Cossura delta	1
05APR93	E	3	3	Mediomastus ambiseta	20
05APR93	E	3	3	Pectinaria gouldii	1
05APR93	E	3	3	Hobsonia florida	13
05APR93	E	3	3	Oligochaetes (unidentified)	2
05APR93	E	3	3	Oxyurostylis sp.	1
05APR93	E	3	3	Ophiuroidea (unidentified)	1
05APR93	E	3	10	Rhynchocoel (unidentified)	3
05APR93	E	3	10	Lumbrineris parvapedata	1
05APR93	E	3	10	Paraprionospio pinnata	2
05APR93	E	3	10	Cossura delta	2
05APR93	E	3	10	Mediomastus ambiseta	3
05APR93	F	1	3	Turbellaria (unidentified)	4
05APR93	F	1	3	Acteocina canaliculata	1
05APR93	F	1	3	Pelecypoda (unidentified)	1
05APR93	F	1	3	Macoma mitchelli	1
05APR93	F	1	3	Mulinia lateralis	9
05APR93	F	1	3	Streblospio benedicti	13
05APR93	F	1	3	Mediomastus ambiseta	34
05APR93	F	1	10	Turbellaria (unidentified)	2
05APR93	F	1	10	Rhynchocoel (unidentified)	2
05APR93	F	1	10	Macoma mitchelli	2
05APR93	F	1	10	Gyptis vittata	1
05APR93	F	1	10	Paraprionospio pinnata	3
05APR93	F	1	10	Streblospio benedicti	1
05APR93	F	1	10	Mediomastus ambiseta	7
05APR93	F	2	3	Rhynchocoel (unidentified)	1
05APR93	F	2	3	Pyramidella crenulata	1
05APR93	F	2	3	Brachidontes exustus	1
05APR93	F	2	3	Macoma mitchelli	1
05APR93	F	2	3	Mulinia lateralis	5
05APR93	F	2	3	Streblospio benedicti	8
05APR93	F	2	3	Capitella capitata	1
05APR93	F	2	3	Mediomastus ambiseta	37
05APR93	F	2	10	Rhynchocoel (unidentified)	3
05APR93	F	2	10	Gyptis vittata	1
05APR93	F	2	10	Capitella capitata	3

Appendix IV. Species data, continued.

05APR93	F	2	10	Mediomastus ambiseta	5
05APR93	F	3	3	Mulinia lateralis	7
05APR93	F	3	3	Streblospio benedicti	17
05APR93	F	3	3	Capitella capitata	1
05APR93	F	3	3	Mediomastus ambiseta	59
05APR93	F	3	10	Rhynchocoel (unidentified)	1
05APR93	F	3	10	Macoma mitchelli	2
05APR93	F	3	10	Paraprionospio pinnata	1
05APR93	F	3	10	Capitella capitata	1
05APR93	F	3	10	Mediomastus ambiseta	2
09JUL93	A	1	3	Littoridina sphinctostoma	1
09JUL93	A	1	3	Mulinia lateralis	2
09JUL93	A	1	3	Streblospio benedicti	1
09JUL93	A	1	3	Mediomastus ambiseta	14
09JUL93	A	1	10	Chironomid larvae	1
09JUL93	A	2	3	Littoridina sphinctostoma	3
09JUL93	A	2	3	Mulinia lateralis	2
09JUL93	A	2	3	Streblospio benedicti	2
09JUL93	A	2	3	Mediomastus ambiseta	23
09JUL93	A	2	3	Chironomid larvae	1
09JUL93	A	2	10	Macoma mitchelli	1
09JUL93	A	2	10	Mediomastus ambiseta	2
09JUL93	A	3	3	Mulinia lateralis	1
09JUL93	A	3	3	Mediomastus ambiseta	21
09JUL93	A	3	10	Macoma mitchelli	1
09JUL93	A	3	10	Capitella capitata	1
09JUL93	A	3	10	Mediomastus ambiseta	3
09JUL93	B	1	3	Streblospio benedicti	1
09JUL93	B	1	3	Mediomastus ambiseta	3
09JUL93	B	1	3	Chironomid larvae	1
09JUL93	B	1	10	Mediomastus ambiseta	2
09JUL93	B	2	3	Littoridina sphinctostoma	2
09JUL93	B	2	3	Macoma mitchelli	1
09JUL93	B	2	10	Mediomastus ambiseta	7
09JUL93	B	3	3	Streblospio benedicti	1
09JUL93	B	3	3	Mediomastus ambiseta	5
09JUL93	B	3	10	Mediomastus ambiseta	10
09JUL93	C	1	3	Streblospio benedicti	12
09JUL93	C	1	10	Capitella capitata	1
09JUL93	C	2	3	Macoma mitchelli	1

Appendix IV. Species data, continued.

09JUL93	C	2	3	Mulinia lateralis	1
09JUL93	C	2	3	Streblospio benedicti	9
09JUL93	C	2	3	Cossura delta	1
09JUL93	C	2	3	Capitella capitata	1
09JUL93	C	2	10	Streblospio benedicti	1
09JUL93	C	2	10	Cossura delta	2
09JUL93	C	2	10	Mediomastus ambiseta	1
09JUL93	C	2	10	Oligochaetes (unidentified)	1
09JUL93	C	3	3	Mulinia lateralis	2
09JUL93	C	3	3	Parandalia ocularis	1
09JUL93	C	3	3	Streblospio benedicti	18
09JUL93	C	3	3	Mediomastus ambiseta	3
09JUL93	C	3	10	Rhynchocoel (unidentified)	1
09JUL93	C	3	10	Caecum johnsoni	4
09JUL93	C	3	10	Ancistrosyllis groenlandica	1
09JUL93	C	3	10	Haploscoloplos foliosus	1
09JUL93	C	3	10	Capitella capitata	1
09JUL93	C	3	10	Mediomastus ambiseta	1
09JUL93	C	3	10	Axiothella mucosa	1
09JUL93	D	1	3	Anthozoa (unidentified)	1
09JUL93	D	1	3	Periploma cf. orbiculare	1
09JUL93	D	1	3	Minuspio cirrifera	1
09JUL93	D	1	3	Paraprionospio pinnata	1
09JUL93	D	1	3	Cossura delta	1
09JUL93	D	1	3	Mediomastus ambiseta	4
09JUL93	D	1	3	Eudorella sp.	1
09JUL93	D	1	10	Abra aequalis	1
09JUL93	D	1	10	Gyptis vittata	1
09JUL93	D	1	10	Naineris sp. A	1
09JUL93	D	1	10	Mediomastus ambiseta	1
09JUL93	D	1	10	Oligochaetes (unidentified)	2
09JUL93	D	1	10	Apseudes sp. A	2
09JUL93	D	2	3	Diopatra cuprea	1
09JUL93	D	2	3	Paraprionospio pinnata	1
09JUL93	D	2	3	Mediomastus ambiseta	1
09JUL93	D	2	3	Microprotopus spp.	1
09JUL93	D	2	3	Apseudes sp. A	3
09JUL93	D	2	10	Rhynchocoel (unidentified)	1
09JUL93	D	2	10	Periploma cf. orbiculare	2
09JUL93	D	2	10	Naineris sp. A	1

Appendix IV. Species data, continued.

09JUL93	D	2	10	Mediomastus ambiseta	3
09JUL93	D	2	10	Oligochaetes (unidentified)	3
09JUL93	D	2	10	Apseudes sp. A	1
09JUL93	D	3	3	Corbula contracta	1
09JUL93	D	3	3	Cossura delta	5
09JUL93	D	3	3	Mediomastus ambiseta	10
09JUL93	D	3	10	Rhynchocoel (unidentified)	1
09JUL93	D	3	10	Corbula contracta	1
09JUL93	D	3	10	Periploma cf. orbiculare	2
09JUL93	D	3	10	Minuspio cirrifera	1
09JUL93	D	3	10	Cossura delta	1
09JUL93	D	3	10	Naineris sp. A	1
09JUL93	D	3	10	Mediomastus ambiseta	1
09JUL93	D	3	10	Oligochaetes (unidentified)	1
09JUL93	D	3	10	Ophiuroidea (unidentified)	1
09JUL93	E	1	3	Macoma mitchelli	1
09JUL93	E	1	3	Mulinia lateralis	10
09JUL93	E	1	3	Glycinde solitaria	1
09JUL93	E	1	3	Paraprionospio pinnata	1
09JUL93	E	1	3	Streblospio benedicti	1
09JUL93	E	1	3	Cossura delta	2
09JUL93	E	1	3	Mediomastus ambiseta	5
09JUL93	E	1	10	Gyptis vittata	3
09JUL93	E	1	10	Paraprionospio pinnata	1
09JUL93	E	1	10	Mediomastus ambiseta	1
09JUL93	E	2	3	Pyramidella crenulata	2
09JUL93	E	2	3	Acteocina canaliculata	1
09JUL93	E	2	3	Macoma mitchelli	1
09JUL93	E	2	3	Mulinia lateralis	11
09JUL93	E	2	3	Glycinde solitaria	2
09JUL93	E	2	3	Streblospio benedicti	1
09JUL93	E	2	3	Cossura delta	1
09JUL93	E	2	3	Mediomastus ambiseta	6
09JUL93	E	2	10	Gyptis vittata	1
09JUL93	E	2	10	Paraprionospio pinnata	3
09JUL93	E	2	10	Paraonidae Grp. B	1
09JUL93	E	2	10	Oligochaetes (unidentified)	2
09JUL93	E	3	3	Rhynchocoel (unidentified)	1
09JUL93	E	3	3	Mulinia lateralis	5
09JUL93	E	3	3	Streblospio benedicti	2

Appendix IV. Species data, continued.

09JUL93	E	3	3	Cossura delta	1
09JUL93	E	3	3	Mediomastus ambiseta	5
09JUL93	E	3	10	Gyptis vittata	1
09JUL93	E	3	10	Paraprionospio pinnata	2
09JUL93	E	3	10	Mediomastus ambiseta	1
09JUL93	E	3	10	Oligochaetes (unidentified)	3
09JUL93	F	1	3	Rhynchocoel (unidentified)	1
09JUL93	F	1	3	Gyptis vittata	1
09JUL93	F	1	3	Streblospio benedicti	2
09JUL93	F	1	3	Mediomastus ambiseta	12
09JUL93	F	1	10	Paraprionospio pinnata	3
09JUL93	F	1	10	Mediomastus ambiseta	16
09JUL93	F	2	3	Gyptis vittata	1
09JUL93	F	2	3	Paraprionospio pinnata	2
09JUL93	F	2	3	Mediomastus ambiseta	4
09JUL93	F	2	10	Glycinde solitaria	1
09JUL93	F	2	10	Paraprionospio pinnata	1
09JUL93	F	2	10	Mediomastus ambiseta	18
09JUL93	F	3	3	Macoma mitchelli	1
09JUL93	F	3	3	Paraprionospio pinnata	2
09JUL93	F	3	3	Streblospio benedicti	2
09JUL93	F	3	3	Mediomastus ambiseta	22
09JUL93	F	3	10	Glycinde solitaria	1
09JUL93	F	3	10	Mediomastus ambiseta	13
11OCT93	A	1	3	Streblospio benedicti	3
11OCT93	A	1	3	Mediomastus ambiseta	2
11OCT93	A	1	10	No species observed	0
11OCT93	A	2	3	Streblospio benedicti	6
11OCT93	A	2	3	Mediomastus ambiseta	1
11OCT93	A	2	10	No species observed	0
11OCT93	A	3	3	No species observed	0
11OCT93	A	3	10	No species observed	0
11OCT93	B	1	3	Mulinia lateralis	1
11OCT93	B	1	3	Mediomastus ambiseta	1
11OCT93	B	1	10	Glycinde solitaria	1
11OCT93	B	1	10	Mediomastus ambiseta	2
11OCT93	B	2	3	Rhynchocoel (unidentified)	2
11OCT93	B	2	3	Parandalia ocularis	2
11OCT93	B	2	3	Mediomastus ambiseta	1
11OCT93	B	2	10	Mediomastus ambiseta	6

Appendix IV. Species data, continued.

11OCT93	B	3	3	Mediomastus ambiseta	1
11OCT93	B	3	10	Mediomastus ambiseta	3
11OCT93	C	1	3	Rhynchocoel (unidentified)	1
11OCT93	C	1	3	Paraprionospio pinnata	1
11OCT93	C	1	3	Streblospio benedicti	1
11OCT93	C	1	3	Spiochaetopterus costarum	2
11OCT93	C	1	3	Haploscoloplos foliosus	1
11OCT93	C	1	3	Mediomastus ambiseta	11
11OCT93	C	1	3	Ophiuroidea (unidentified)	1
11OCT93	C	1	10	Spiochaetopterus costarum	1
11OCT93	C	1	10	Cossura delta	2
11OCT93	C	1	10	Mediomastus ambiseta	9
11OCT93	C	2	3	Mulinia lateralis	2
11OCT93	C	2	3	Paraprionospio pinnata	1
11OCT93	C	2	3	Streblospio benedicti	2
11OCT93	C	2	3	Spiochaetopterus costarum	1
11OCT93	C	2	3	Mediomastus ambiseta	19
11OCT93	C	2	3	Ophiuroidea (unidentified)	2
11OCT93	C	2	10	Rhynchocoel (unidentified)	1
11OCT93	C	2	10	Sigambra bassi	1
11OCT93	C	2	10	Gyptis vittata	2
11OCT93	C	2	10	Paraprionospio pinnata	1
11OCT93	C	2	10	Cossura delta	1
11OCT93	C	2	10	Haploscoloplos foliosus	1
11OCT93	C	2	10	Mediomastus ambiseta	11
11OCT93	C	3	3	Anthozoa (unidentified)	1
11OCT93	C	3	3	Mulinia lateralis	2
11OCT93	C	3	3	Spiochaetopterus costarum	1
11OCT93	C	3	3	Mediomastus ambiseta	5
11OCT93	C	3	3	Ophiuroidea (unidentified)	1
11OCT93	C	3	10	Spiochaetopterus costarum	1
11OCT93	C	3	10	Mediomastus ambiseta	1
11OCT93	D	1	3	Rhynchocoel (unidentified)	1
11OCT93	D	1	3	Sigambra tentaculata	1
11OCT93	D	1	3	Paraprionospio pinnata	1
11OCT93	D	1	3	Cossura delta	2
11OCT93	D	1	3	Armandia maculata	1
11OCT93	D	1	3	Mediomastus ambiseta	3
11OCT93	D	1	10	Rhynchocoel (unidentified)	2
11OCT93	D	1	10	Lumbrineris parvapedata	1

Appendix IV. Species data, continued.

11OCT93	D	1	10	Minuspio cirrifera	2
11OCT93	D	1	10	Cossura delta	3
11OCT93	D	1	10	Naineris sp. A	1
11OCT93	D	1	10	Mediomastus ambiseta	2
11OCT93	D	1	10	Oligochaetes (unidentified)	1
11OCT93	D	1	10	Apseudes sp. A	1
11OCT93	D	1	10	Ophiuroidea (unidentified)	1
11OCT93	D	2	3	Rhynchocoel (unidentified)	2
11OCT93	D	2	3	Periploma margaritaceum	4
11OCT93	D	2	3	Minuspio cirrifera	3
11OCT93	D	2	3	Paraprionospio pinnata	1
11OCT93	D	2	3	Streblospio benedicti	2
11OCT93	D	2	3	Mediomastus ambiseta	4
11OCT93	D	2	3	Ophiuroidea (unidentified)	1
11OCT93	D	2	10	Rhynchocoel (unidentified)	2
11OCT93	D	2	10	Periploma cf. orbiculare	1
11OCT93	D	2	10	Periploma margaritaceum	2
11OCT93	D	2	10	Paleanotus heteroseta	1
11OCT93	D	2	10	Cossura delta	2
11OCT93	D	2	10	Mediomastus ambiseta	2
11OCT93	D	2	10	Oligochaetes (unidentified)	1
11OCT93	D	2	10	Ophiuroidea (unidentified)	1
11OCT93	D	3	3	Periploma margaritaceum	5
11OCT93	D	3	3	Minuspio cirrifera	2
11OCT93	D	3	3	Mediomastus ambiseta	2
11OCT93	D	3	10	Rhynchocoel (unidentified)	1
11OCT93	D	3	10	Periploma margaritaceum	2
11OCT93	D	3	10	Minuspio cirrifera	7
11OCT93	D	3	10	Mediomastus ambiseta	1
11OCT93	D	3	10	Ophiuroidea (unidentified)	1
11OCT93	E	1	3	Nassarius acutus	1
11OCT93	E	1	3	Pyramidella crenulata	1
11OCT93	E	1	3	Streblospio benedicti	2
11OCT93	E	1	3	Mediomastus ambiseta	8
11OCT93	E	1	10	Paraprionospio pinnata	2
11OCT93	E	1	10	Streblospio benedicti	2
11OCT93	E	1	10	Mediomastus ambiseta	3
11OCT93	E	1	10	Oligochaetes (unidentified)	2
11OCT93	E	2	3	Pyramidella crenulata	1
11OCT93	E	2	3	Paraprionospio pinnata	1

Appendix IV. Species data, continued.

11OCT93	E	2	3	Streblospio benedicti	8
11OCT93	E	2	3	Mediomastus ambiseta	4
11OCT93	E	2	10	Caecum johnsoni	1
11OCT93	E	2	10	Ancistrosyllis groenlandica	1
11OCT93	E	2	10	Gyptis vittata	2
11OCT93	E	2	10	Paraprionospio pinnata	2
11OCT93	E	2	10	Streblospio benedicti	1
11OCT93	E	2	10	Paraonidae Grp. A	1
11OCT93	E	2	10	Mediomastus ambiseta	5
11OCT93	E	3	3	Nassarius acutus	1
11OCT93	E	3	3	Streblospio benedicti	4
11OCT93	E	3	3	Mediomastus ambiseta	3
11OCT93	E	3	10	Paraprionospio pinnata	4
11OCT93	E	3	10	Cossura delta	1
11OCT93	E	3	10	Mediomastus ambiseta	2
11OCT93	F	1	3	Paraprionospio pinnata	1
11OCT93	F	1	3	Streblospio benedicti	4
11OCT93	F	1	3	Mediomastus ambiseta	1
11OCT93	F	1	3	Ampelisca abdita	4
11OCT93	F	1	10	Parandalia ocularis	2
11OCT93	F	1	10	Paraprionospio pinnata	1
11OCT93	F	1	10	Streblospio benedicti	1
11OCT93	F	1	10	Mediomastus ambiseta	1
11OCT93	F	2	3	Rhynchocoel (unidentified)	1
11OCT93	F	2	3	Paraprionospio pinnata	1
11OCT93	F	2	3	Streblospio benedicti	6
11OCT93	F	2	3	Mediomastus ambiseta	5
11OCT93	F	2	3	Megalops	1
11OCT93	F	2	3	Ampelisca abdita	2
11OCT93	F	2	10	Cossura delta	1
11OCT93	F	2	10	Mediomastus ambiseta	2
11OCT93	F	3	3	Rhynchocoel (unidentified)	1
11OCT93	F	3	3	Nassarius acutus	1
11OCT93	F	3	3	Streblospio benedicti	3
11OCT93	F	3	3	Spiochaetopterus costarum	1
11OCT93	F	3	3	Mediomastus ambiseta	5
11OCT93	F	3	3	Ampelisca abdita	1
11OCT93	F	3	10	No species observed	0